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ADDRESSES AND ORIGINAL ARTICLES

PRINCIPLES OF X RAY THERAPY OF MALIGNANT DISEASES *

BY HENRI COUTARD, M.D.

CHIEF OF THE DEPARTMENT OF X RAY THERAPY FOR CANCER, RADIUM INSTITUTE OF THE UNIVERSITY OF PARIS (FONDATION CURIE)

(WITH ILLUSTRATIVE PLATES)

THE discussion of the principles of X ray therapy of malignant tumours will be divided into four parts:

(*a*) Some results of sufficiently long standing to show that the cure of cancer by X ray therapy is possible.

(*b*) The physical and clinical technique by means of which these results have been obtained.

(*c*) General biological principles.

(*d*) Present knowledge of X ray therapy of cancer.

Results of X Ray Therapy of Cancer

It is certain that some cancers can be cured by X rays, but the proportion of cures is at present rather small and local and general accidents, early or late, are not infrequent.

In Tables I., II., and III. we reproduce the results obtained by X ray treatment in some cases specially studied at the Fondation Curie.

TABLE I

Lymphosarcoma of the mouth, tongue, and nasopharynx

Cases treated from 1920 to 1926.	Survivals after 5 years.	Survivals after 7 years.
45	8 (17%)	8 (17%)

In lymphosarcoma, lymphatic metastases are generally frequent, especially during the first years. The cured cases remained in good health, without metastases, for from between 5 and 7 years.

TABLE II

Epithelioma of the tonsillar region

Cases treated from 1920 to 1926.	Survivals after 5 years.	Survivals after 7 years.
46	13 (28%)	8 (17%)

Of the 13 patients still alive five years after their treatment, 5 died between the fifth and seventh year, 4 of them from abdominal or thoracic metastases.

TABLE III

Epithelioma of the larynx

Cases treated from 1920 to 1926.	Survivals after 5 years.	Survivals After 7 years.
77	22 (28%)	21 (27%)

Of 22 patients who survived five years, only one died between the fifth and seventh year from a local recurrence.

We have to keep in mind that the proportion of cures is not so high every year; in some years the number increases, in others it drops. For instance, for epitheliomas of the tonsil and soft palate the year 1925 was a bad one. Out of 13 patients treated, only one patient is alive five years afterwards—i.e., 7 per cent. For epithelioma of the larynx the year 1922 was a bad one. Of 11 patients treated, not one was alive after three years; in the previous year however (1921) out of eight patients treated, four were still living when inquiry was made at the end of 1933—i.e., about 12 years after treatment.

In the larynx, more than in any other site, some cancers are easy and some very difficult to treat. X ray therapy of cancer of the larynx is relatively easy when the growth has only slightly immobilised the muscle and not yet invaded the cartilage. In these cases there are few failures and few accidents. The cutaneous dose necessary for the healing of these cancers is small, on an average 6000 r (on the skin), with fields of 50 sq. cm. and a duration of 15–25 days.

X ray treatment of radioresistant *cancers of the larynx*, which have immobilised the hemi-larynx, infiltrated the muscle, and invaded the cartilage, is generally difficult. In spite of heavy doses these cases are not often cured and accidents may occur. Doses of 7000 to 8000 r or more are required and often constitute the maximum supported by the tissues. This is a great difficulty which may be made less serious by a better distribution of the energy in the time. Nevertheless, X ray therapy being still in its infancy, it must, in radioresistant cancers, frequently yield to surgery or be combined with surgery; for we must not forget that, in laryngeal cancers for instance, while X rays may be applied without danger to a recurrence following surgical operation, surgical intervention after X ray application is often dangerous.

The treatment of *cancer of the uterus* has given, at the Fondation Curie, results generally superior to those mentioned above, but X rays have rarely been applied alone. There has been nearly always an association of X rays and radium.

Cancer of the breast appears to be influenced most favourably by X rays, but our results do not cover a sufficiently long period to be reproduced here. The time needed for collecting control statistics of cancer of the breast is necessarily very long, since many cases are of slow evolution.

TWO ILLUSTRATIVE CASES

In order to give some idea of the appearance and extent of the lesions of the larynx and pharynx which X ray therapy is capable of causing to disappear, we reproduce radiograms, taken before and after treatment, of two extensive and certainly inoperable cancers.

The first case is that of an epithelioma of the larynx.

Fig. I., with explanatory diagram, shows a lesion which has invaded the whole of the larynx, from the hyoid bone to the inferior border of the cricoid. The transparent laryngeal space has disappeared at the level of the thyroid cartilage, the cricoid and the crico-thyroid space. The thyroid cartilage is partly destroyed. The pre-epiglottic space is invaded so that the thyroid portion of the epiglottis is forced backwards. The cricoid is pushed forwards, indicating an invasion of the pharynx through the spread of the neoplasm beyond the larynx. Clinically there was complete immobility of both halves of the larynx and a tracheotomy had to be performed.

Fig. II., taken one month later, shows considerable reduction of the lesion: the epiglottis has returned to its normal position. The laryngeal transparency is beginning to reappear and the transparent area of the ventricle of Morgagni is particularly noticeable.

Fig. III., with explanatory drawing, shows, a year later, the return of the larynx to its normal state. It has been possible to remove the tracheotomy tube; the transparent laryngeal space is normal, and the epiglottis, thyroid, and cricoid cartilages have regained their usual appearance. The patient is at present in good health.

* Delivered at the Rooms of the Medical Society of London on Feb. 15th, 1934, on the occasion of the opening ceremony of the X ray department of the Marie Curie Hospital.

The second case is that of an epithelioma of the hypopharynx.

Fig. IV. shows a lesion of the hypopharynx, extending from the entrance of the œsophagus below, that is to say, the inferior border of the cricoid, up to 2 cm. above the angle of the mandible, an estimated length of 7 to 8 cm. The hyoid bone, the cricoid cartilage, and the thyroid are pushed forward from the vertebral bodies by the neoplastic mass.

Fig. V. shows the return to the normal state one year and three months later. The tumour has disappeared; the hyoid bone, the thyroid, and the cricoid are again in contact with the vertebral bodies. This patient, after remaining cured locally, died six years later from pulmonary metastases.

Physical and Clinical Technique

Factors to be considered include tension, filtration, focal distances, fields, and dosage.

The results recorded above have been obtained under the following conditions:—

With a maximum tension of 190 to 200 kilovolts we have used 2 mm. of zinc and 3 mm. of aluminium, covered by 3 cm. of wood. The focal distances have been 50 to 60 cm. for lesions of the head and neck. For deeply situated lesions, such as cancer of the uterus, the focal distances have been 80 to 100 cm.

The quantity of energy, or dose delivered, has been measured on the skin and calculated in international r units.

The number of fields or ports of entry, their shape and size, have, of course, varied according to the extent of the lesion, its depth, and the glandular spread. In general, in dangerous zones—i.e., the head and neck—the area of the fields has been from 50 to 100 square cm., with alternating cutaneous doses which have been able to reach as a maximum in some cases 700 and even 800 r per day, during one, two, or three days; sometimes a dosage of only 200 to 300 r per day has been used, or even less. In tolerant zones, such as the subumbilical abdomen, the area of the fields has been on an average 250 to 300 square cm., with alternating cutaneous doses not exceeding 500 r per day.

Among the epithelial cancers which we have treated, those which have definitely disappeared have had depth doses ranging from 3000 to 4000 r for the radiosensitive, non-infiltrating forms and doses a little higher for the radioresistant forms. These figures correspond approximately to the doses received by the most deeply situated parts of the neoplastic lesion.

TECHNIQUE

The technical part of the treatment has thus consisted in delivering to the deepest parts of the neoplastic lesion the quantity of energy considered expedient. The total cutaneous dose has necessarily had to be much higher than the cancericidal dose or depth dose when the distance from cancer to skin was great and when the fields were small. The total cutaneous dose may be relatively little different from the depth dose if the fields are large and the distance from cancer to skin is small. Thus it happened that the total cutaneous doses in the cases of cancer of the larynx in thin subjects were only 50 per cent. greater than the dose which would produce disappearance of the cancer, while in cancer of the uterus they were in certain cases, in spite of the use of large fields, four times greater than the cancericidal depth dose; the utilisation of six to eight fields or more was thus unavoidable. The use of numerous fields has given rise to research in Germany on the depth dose as compared with the surface doses; these researches have been carried out with remarkable precision by means of calculation and the phantom.

Most of the sites which we have systematically treated have been chosen from among those which it was possible to observe clinically each day. We have always preferred to rely on a daily examination of the patient rather than in a knowledge of the depth dose. This examination involves daily verification of changes in the appearance of the neoplasm, of the vasculo-connective tissue and of the mucous membranes adjoining the neoplasm; observation of the glandular secretions; and a note of the general reaction of the organism. Indeed, as we shall see later on, while the dose is an element of the X ray therapy of cancer (though an element very difficult to determine in advance), the biological conditions under which this dose must be distributed are sometimes more important, the exception being in the case of the very small, superficial, and very radiosensitive cancers.

VASCULO-CONNECTIVE TISSUE AND GLANDULAR RADIOREACTIONS

The most prominent and most evident vasculo-connective tissue radioreactions are the early œdema, the erythema of the skin, and the local congestion of the mucous membranes. Sometimes they develop in a progressive manner and in this case they may not be too harmful. Sometimes they appear abruptly in the course of treatment when the dose or the intensity has been increased too much; in this case they are as incompatible with the involution of the cancer as with the conservation of the medium in which the cancer is growing.

The œdema, erythema, and local mucosal congestion are most often preceded by slight modifications of the vasculo-connective tissue, sometimes hardly appreciable locally. These slight modifications bring about local and general subjective disorders, such as the sensation of local uneasiness, swelling, pain, general malaise, and in the more marked cases, the appearance of nausea, asthenia, cardiac disturbance, and rise of temperature. Sometimes there is an enormous disproportion between the small doses given and the severity of the effects produced in the local tissues and on the general condition. The general effect of these symptoms necessitates the moderation of treatment, because apparently trifling lesions of the vasculo-connective tissue, and symptoms hardly appreciable during the course of the treatment, are sometimes, after three to four weeks, followed by marked modifications of the normal tissue, which modifications increase considerably after some years.

The changes in the glandular secretions manifest themselves by subjective and objective phenomena. In particular, when the salivary secretion, for example, becomes too abundant, glandular modifications are already appreciable. One must not wait, before reducing the treatment, until the secretions of the glands of the buccal cavity are thick, viscous, and adherent, until the perversion of taste is absolute and until these disturbances hinder the nutrition of the patient.

THE THREE PRINCIPAL TYPES OF EPITHELIAL RADIOREACTION

Since epithelial radioreactions have been our principal guides during X ray therapy of cancer, it is necessary to learn to recognise them. They are easier to observe than the radioreactions of the vasculo-connective tissue.

The first epithelial radioreaction to be recognised was the cutaneous "radio-epidermitis" described by Regaud and Nogier in 1913. In 1922 I described the "radio-epithelitis" of the mucous membranes of the pharynx and buccal cavity. These two radioreactions occur in the covering pavement

epithelial cells. There exists a third reaction, the radio-epithelitis of the columnar epithelial cells.

The three epithelial radioreactions consist essentially in the destruction of the epithelial cells covering the site of the irradiated surfaces. On the mucous membranes they manifest themselves by the disappearance of the epithelial layers, the denudation of the chorion which becomes covered by fibrin and false membranes. The false membranes are sometimes blood-stained, thick, or greyish when the treatment has been too intense or when there is superadded infection. The false membranes ought to be thin and clear if the dose has not considerably overstepped the threshold of reaction. In this case the radio-epithelitis is almost painless; it does not become infected and it is rapidly repaired, leaving no trace. Cutaneous radio-epidermitis presents the same characters, loss of epithelial layers and denudation of the dermis. There should be no tendency to hæmorrhage, there is no objection to the production of a slight exudation, and in this case repair will not be delayed.

When daily doses of approximately 350 to 400 r, in two séances, are given to the skin of the cervical region,[1] the three epithelial radioreactions manifest themselves at fixed periods in relation to the commencement of irradiation. They can be particularly well studied in this region where the different types of mucous membrane are very close one to the other.

The aryteno-epiglottic folds constitute a lateral wall of separation between the larynx and pharynx. On the crest of this wall there exists a mucous membrane covered by very fragile stratified epithelium. In this zone, radio-epithelitis of the stratified cells generally appears towards the 13th or 14th day after the beginning of irradiation; this is the earliest of the epithelial radioreactions of this region. Lower down, in the larynx, at the level of the vocal cords, where the stratified epithelium resembles that of the skin, radio-epithelitis appears, towards the 27th or the 28th day, at the same time as the cutaneous radio-epidermitis. At the level of the ventricular bands and below the glottis, on the mucosa covering the tracheal rings, the epithelium is cylindrical or columnar. Radio-epithelitis of the cylindrical-celled mucosa appears third, towards the 39th or 40th day.

If irradiation is more intense, the radioreactions appear earlier, respectively on the 10th and the 24th day, for the two first; sometimes the third reaction appears a very few days after the second. It seems that in the course of an intense treatment, the different varieties of cells lose the property of disintegrating and disappearing at the times, fixed, constant and characteristic of each type; they conserve the property only when the irradiation has been normal.

If irradiation is less intense, the radioreactions are retarded; they appear towards the 18th, 34th, and 48th days respectively. Under a certain threshold, that is, with less than a certain daily dose, they do not appear at all.

THE DURATION OF EPITHELIAL RADIOREACTIONS

The repair of each of the three epithelial radioreactions ought to be at its maximum in two weeks after its onset, the radio-epithelitis of the stratified-celled mucosa ought to be repaired by the twenty-sixth day, at the time of the appearance of the cutaneous radio-epidermitis. The cutaneous radio-epidermitis, like the radio-epithelitis of the stratified-celled mucosa resembling the cutaneous type, ought to be repaired by the thirty-ninth day, at the time of the appearance of the radio-epithelitis of the cylindrical epithelium. Radio-epithelitis of the cylindrical cells ought to be repaired towards the fifty-fifth day. Altogether the three principal epithelial radiolesions are thus spread over six weeks, that is to say, they appear at the beginning of the third and disappear at the beginning of the ninth week. This at least is what happens if the irradiation has been given in the time and under the conditions indicated above, with a maximum field of 50 square cm.

One ought to endeavour to obtain epithelial radioreactions of 10 to 12 days' duration when treating cancers so extensive that fields larger than 50 square cm. are necessary. For a very extensive cancer, necessitating a field in the order of 100 to 125 square cm., the duration of repair of the radioreactions ought not to exceed eight days.

Above 150 square cm. and particularly for the large abdominal fields of 3 to 400 square cm., loss of the entire epithelial layers ought to be avoided on the skin as well as on the mucosa of the vagina, intestines, or bladder, and one ought to provoke neither cystitis, proctitis, nor enteritis. The epithelial desquamation ought to be effected without laying bare the dermis or chorion, that is to say, the superficial layers only ought to disappear. Cutaneous radio-epidermitis of the abdomen ought to be non-exudative.

THE APPEARANCE OF THE EPITHELIAL RADIOREACTIONS

The two examples of radio-epithelitis, illustrated in Figs. VI. to XV., show that repair of the radio-epithelitis is effected either by central islands of epithelial cells, whose number increases rapidly at first, so that the islands enlarge quickly and become confluent; or by semicircular epithelial surfaces arising from the periphery and directed towards the centre; or by these two means in association. These are the normal methods of repair, indicating that the vasculo-connective tissue has been relatively preserved. If there is greater change, repair is no longer effected by the islands of cells; it is done by linear cellular formations, as can be observed in the central portion of the radiolesions we have chosen for an example. In this region the borders of the lesion are rectilinear and are covered slowly and with difficulty with epithelial formation.

The first example of prolonged cutaneous radio-epidermitis is that of a patient suffering from epithelioma of the left lateral pharyngeal wall, with pronounced adenopathy on the left side.

Treatment was completed in 22 days. The dose was 7000 r in 22 hours, on the side of the lesion, with two fields of about 80 square cm., one antero-posterior, the other transverse; the two fields overlapped on their borders.

Radio-epidermitis appeared on the 28th day. Repair was very slow, since on the 11th day (Fig. VI.) the radiolesion was still very extensive; it was repaired chiefly from the periphery where the semicircular cellular surfaces are to be seen; very few central islands of epithelial cells exist. Between the 11th and the 16th day, that is, within five days (Fig. VII.), repair was appreciable, but it was only peripheral. After 34 days (Fig. VIII.) a cutaneous linear lesion remained. At this stage epithelial elements are no longer formed; the epithelial cells appear to be incapable of developing in the modified connective tissue.

Complete repair was only effected on the 43rd day (Fig. IX.), with a visible central scar, accompanied by late œdema. In this case the dose has been distributed in too short a time.

The second example of excessive cutaneous radio-epidermitis is that of a patient irradiated from Nov. 3rd to the 28th, 1931, on the sternoclavicular area, through a single field of 190 square cm.

[1] In a man of average musculature it is advisable not to exceed in a period of 13 days a dose of 5000 r, of which 4000 r are on the same side of the neck, with a maximum field of 50 sq. cm. These are irradiations which we are using less and less because, though certain patients have tolerated them and cure of their cancer has been obtained with 6000 r in 15 to 16 days, a large number of patients cannot stand such doses.

6200 r were given in 27 hours, during 26 days, at the rate of two séances a day. Radio-epidermitis appeared late, on Dec. 11th, 1931, that is, on the 39th day (Fig. X.). Three days later, on Dec. 14th (Fig. XI.), repair was already appreciable; it was both peripheral and central. Central islands of epithelial cells were numerous and two days later, on Dec. 16th (Fig. XII.), the radio-epidermitis was reduced by half. From Dec. 16th to 18th the rate of multiplication of the islands was still rapid (Fig. XIII.). From Dec. 14th to 24th (Fig. XIV.), that is to say, in 10 days, the diminution of the surface deprived of epithelium was normal and it seemed clear that final repair would follow. But the lesion then diminished slowly, the radio-epidermitis became linear in the centre, and the connective tissue appeared no longer able to provide for the nutrition of the epithelial cells. Repair was only complete on Jan. 10th, 1932, on the 30th day.

In this case the connective tissue has been too much modified by the rays, as is shown by the appearance of the skin two years later, on Oct. 12th, 1933 (Fig. XV.). Here is shown a permanent alteration in the skin with dyschromia and sclerosis. It would have been better to reduce the dose to 5000 r, considering the large dimensions of the field, or else substantially to prolong the duration of the treatment.

This excessive duration of radio-epidermitis and also of radio-epithelitis is caused by an exaggerated modification of the vasculo-connective tissue. In these conditions the nutrition of the epithelial cells is imperfect; these cells at first multiply rapidly, then more and more slowly because there is more and more difficulty in finding the substances necessary for their metabolism. It becomes an effort to cover over the whole surface of the dermis or the bare chorion. No wound is repaired so slowly as is a radio-epidermitis if the vasculo-connective tissue has been damaged by irradiations; and on the other hand no wound is repaired so quickly if the vasculo-connective tissue has been preserved, while the naked-eye appearance of the two lesions differs very little.

General Biological Principles

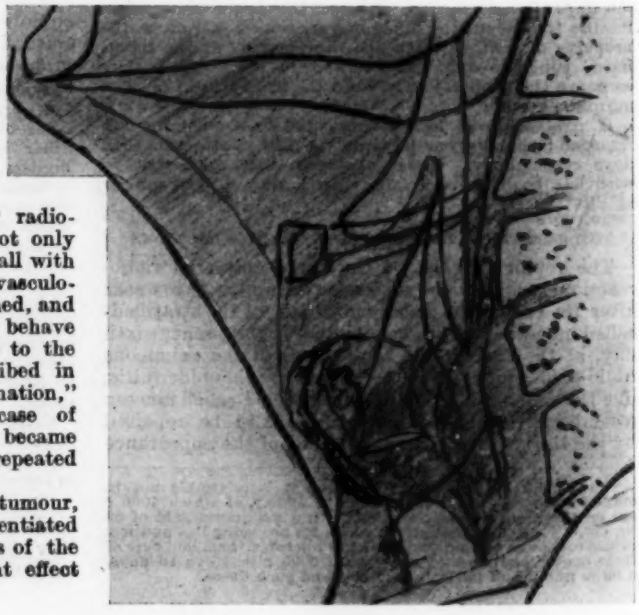
THE EFFECT OF VASCULO-CONNECTIVE TISSUE RADIO-REACTIONS ON RADIOSENSITIVITY OF CANCER CELLS

Like the nutrition of the normal epithelial cells in the course of the repair of a radio-epidermitis, the nutrition of the cells of an epithelioma during irradiation is dependent upon the conservation of the medium, in which it lies, that is, of the vasculo-connective tissue.

If the total dose, or the daily dose, or the intensity per minute has been too high, if the field has been too large in relation to the doses, or if the filtration or the tension has been too low, the connective tissue may be modified. The nutrition of the epithelioma cells thus becomes difficult. The cellular radiosensitivity, which seems to be linked up not only with the youthfulness of the cells but above all with the activity of their interchanges with the vasculo-connective tissue, is modified, often diminished, and sometimes suppressed. The cancer cells behave clinically as if they had become insensitive to the irradiations. This is what Regaud described in 1913, under the name of "radiovaccination," after an extremely careful study of a case of spindle-celled sarcoma of the scalp which became radioresistant in the course of intense and repeated treatments.

In the case of a very embryonic tumour, such as lymphosarcoma, or an undifferentiated epidermic epithelioma, the radiomodifications of the vasculo-connective tissue have a very slight effect upon the radiosensitivity of the cancer cells because this sensitivity is pronounced. In a highly differentiated tumour, either an epidermoid epithelioma, with prickle cells predominating, which is infiltrating the muscle, or a tubular adenocarcinoma, the radiomodifications of the vasculo-connective tissue are of the utmost importance because the radiosensitivity of these tumours is feeble.

In the first case, the effect of X rays on the cancer cells is always rapid, sometimes immediate. According to their type, the cells of tumours of embryonic type die in the course of the first two weeks, more rarely from the fifteenth to the twenty-fifth day after the start of irradiation. Most often the modifications of the vasculo-connective tissue are



DR. HENRI COUTARD: PRINCIPLES OF X RAY THERAPY OF MALIGNANT DISEASE

FIG. I

Epithelioma invading the whole larynx, and necessitating tracheotomy. Anteriorly, the pre-epiglottic region is invaded; posteriorly, the neoplasm extends beyond the arytenoid fold and reaches the posterior part of the cricoid.

FIG. II

Regression of the lesion a month after the beginning of X ray therapy. The laryngeal transparent space has reappeared.

FIG. III

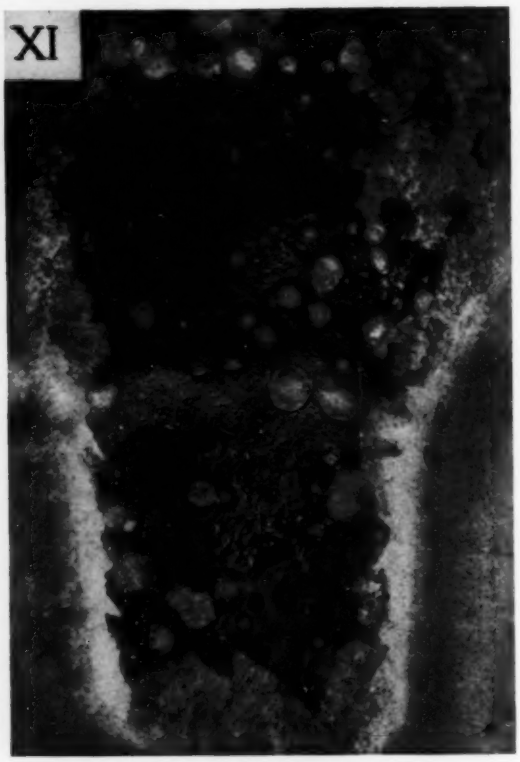
Return to normal, the tracheotomy tube having been removed. A year and a half after treatment the patient is apparently cured locally.

FIG. IV

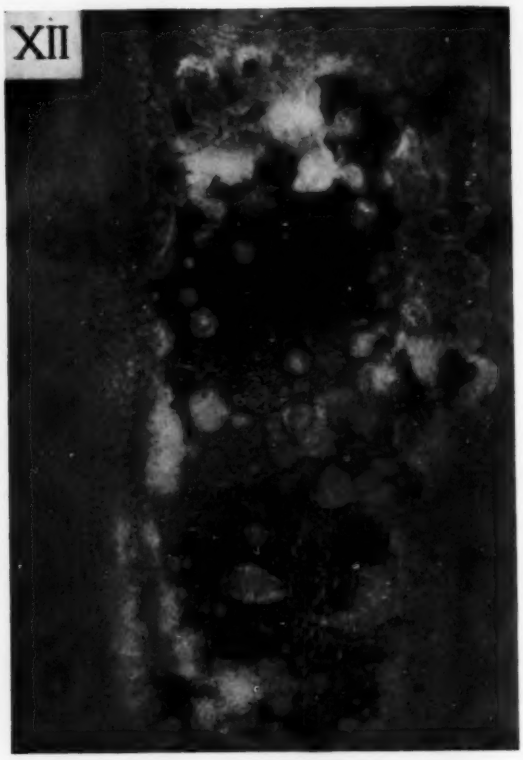
Epithelioma of the hypopharynx, extending from the mouth of the œsophagus up to 2 cm. above the angle of the mandible. The laryngeal cartilages are pushed forward, away from the vertebral bodies.

FIG. V

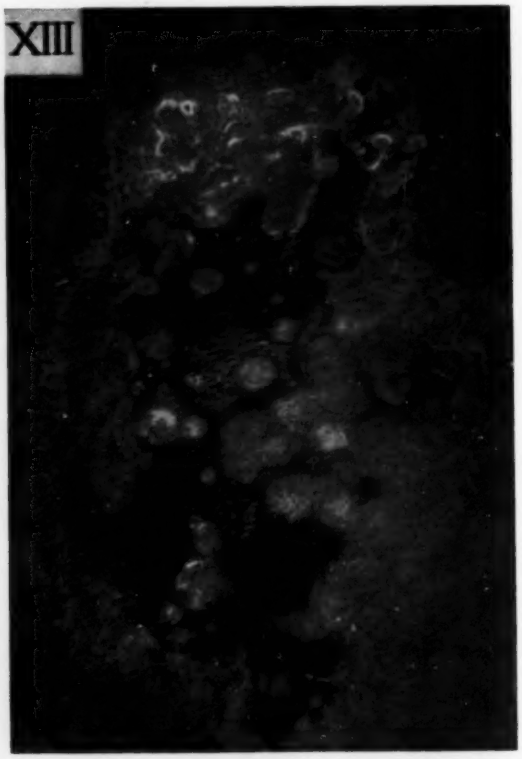
Disappearance of the tumour shown in Fig. IV.; the relation of the larynx to the vertebral bodies is now normal, and the hyoid bone and the thyroid are in contact with the vertebral bodies.



Third day after the onset of radio-epidermitis in case shown in Fig. X. Repair begun by means of peripheral epithelial islands and some central islands.



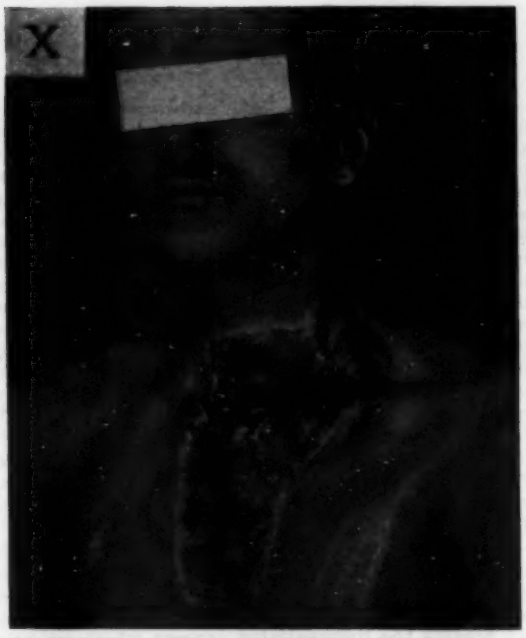
Fifth day. The size of the radio-epidermitis has decreased by half.



Seventh day. The radio-epidermitis seems to be diminishing very rapidly.

Seventeenth day. Repair is still rapid but tends to be no longer effected by epithelial islands but by rectilinear groups of epithelial cells.

(*Figs. VI. to IX. appear on a later page*)



Appearance of a radio-epidermitis on the 39th day after the beginning of treatment.

not sufficiently early nor sufficiently great to reduce the radiosensitivity of the embryonic cancer cells in any appreciable manner.

In the second case, the effect of X rays on the differentiated cancer cells is not immediate. It appears slowly, little by little, in the course of a very long time, the exception being for the cells which were in mitosis from the beginning of treatment. If the vasculo-connective tissue remains perfectly normal, the less differentiated cells disappear from the forty-fifth day after the beginning of treatment; the more differentiated towards the ninetieth and sometimes the hundredth day. If the vasculo-connective tissue is modified by the irradiations, experience shows that disappearance of differentiated cells does not occur.

THE DAILY QUANTITIES OF ENERGY AND THE RADIO-RESISTANCE OF THE CANCER CELLS

Up to 1926 we thought that the essential cause of loss of radiosensitivity of the cancer cells, in the course of treatment, was the length of each treatment and we set ourselves to give treatments of short duration.

In fact we had observed that cures of certain cancers were obtained only when the duration of treatment had not exceeded 15 to 16 days. After this time the cells seemed to be no longer altered by the irradiations and the general condition of the patient was made worse. In these cases, during the first week of treatment, the skin dose had been very high, 4000 to 4500 r; the remainder, about 2000 r, had been given during the following week, with weaker daily doses. Thus, a dose of 4500 r in six days necessitated giving 750 r per day, that is to say, a considerable daily quantity of energy, with high minute intensity.

Later, we were able to observe that if we gave this same initial dose of 4500 r in 10 to 12 days, instead of six days, it was possible to obtain cure with a longer treatment than in the preceding cases, on condition that the total duration of treatment did not exceed 20 to 21 days. After 20 to 21 days of irradiation the cancer seemed to become insensitive; a treatment of longer duration was generally inefficacious. In these cases the daily dose for the first 10 days was about 450 r. Subsequently, the duration of treatment was progressively increased up to 30 days, then up to 40 days; in this last case, it was possible to obtain cure when the daily dose during the first 10 days did not exceed 300 r. Little by little, also, in the course of years, it became evident that the chronology limit of treatment, beyond which the cancer seemed to become insensitive, was not fixed.

Observation of clinical facts shows us that changes in the vasculo-connective tissue result much more from excessive daily doses and excessive intensity per minute than from the excess of the total dose. Thus, for the same total dose, the daily doses are necessarily increased with diminution of the duration of the treatment. Consequently, the shorter the duration of the treatment and the higher the daily doses, the quicker appear the changes in the supporting tissue, that is, the vasculo-connective tissue, and the quicker is manifested the reduction of radiosensitivity of the cancer. Conversely, radiosensitivity was the longer preserved when the daily doses were weaker, that is to say, when the duration of treatment was longer, always provided that the daily doses were not less than the threshold dose necessary for the disappearance of the neoplastic cells.

THE TOTAL QUANTITY OF ENERGY OR DOSE AND THE CURE OF UNDIFFERENTIATED OR NOT VERY HIGHLY DIFFERENTIATED CANCERS

During the years 1920 to 1926 the duration of treatment for the cured epitheliomas was on an average from 15 to 21 days for the larynx, from 25

Same case as shown in Figs. X. to XIV. two years after beginning of treatment; permanent modification of the skin. Dyschromia and sclerosis. The too intense radio-epidermitis (duration 30 days) has taken too long to be repaired. With a field of this size repair ought to be effected in 8 to 10 days.

to 31 days for the hypopharynx, and from 30 to 40 days for the tonsillar region. For lymphosarcomas it was from 13 to 30 days. The total doses for the cured epitheliomas was from 6000 to 8000 r, measured on the skin; the daily doses during the first week were of 350 r for cancers treated in 25 to 30 days, and from 600 to 700 r for cancers treated in a short time. The intensity per minute varied between 3 r and 5 r.

Under these conditions of treatment we necessarily produced considerable modifications of the vasculo-connective tissue; this is why we were only able to cure those epitheliomas in which the changes in this tissue were of little importance, that is to say, the undifferentiated or slightly differentiated epitheliomas. Cure of differentiated cancers or of cancers infiltrating the muscles was exceptional.

We next thought it possible to obtain cure in differentiated cancers by increasing the dose. These efforts were fruitless. Under the same conditions of treatment, increasing the dose above 10,000 r up to 12,000 r, and even 15,000 r, never gave us a single case of cure but always aggravated the general condition of the patient; modifications of the vasculo-connective tissue were more and more marked and demonstrated more and more clearly the loss of sensitivity, besides radio-accidents of all kinds.

THE SYSTEMATIC LENGTHENING OF THE CHRONOLOGY OF TREATMENT AND THE CURE OF DIFFERENTIATED EPITHELIOMAS

Since we became convinced that radioresistance of cancers is the result of excessive daily doses and too high intensity per minute, acting through modification of the vasculo-connective tissue, and was not due to treatment having been spread over too long a time as we had formerly believed, we were naturally led to prolong the duration of treatment for cancers which seemed to us to derive benefit from this prolongation.

It was for this reason that from 1927 to 1933 we have, with our collaborator F. Baclesse, extended the duration of treatment for certain cancers, little by little, from 30 to 90 days, by means of weak daily doses (in the order of 175, 200, 225, or 250 r per day), distributed in two séances, without varying the other factors and particularly the size of the fields. We were able thus to obtain disappearance of cancers which up to then we had considered radioresistant and which we had never cured, such as very differentiated epidermoid epitheliomas, invading the muscles and cartilages, glandular epitheliomas of the breast and of the thyroid body, and special round-celled epitheliomas of the upper part of the ethmoid and adjacent sinuses.

In glandular cancers of the breast we had only, up to then, using heavy doses given in under 30 days, obtained amelioration, exceptionally definite disappearance, or even local disappearance followed by the development of lesions in neighbouring glands or distant metastases. We believe that, for these very differentiated tumours, rapid and intense X ray therapy, given in less than 30 days, is often one of the causes of the development of metastases. On the contrary, the treatment of very differentiated epitheliomas by small doses, capable of preserving the vasculo-connective tissue, that is to say, by small daily doses repeated over a period of 45, 50, and even 70 days, seems to us actually more favourable and gives us better results not only locally, but in a slower development of glands, and in a lessened frequency of metastases.

Present Knowledge of X Ray Therapy of Cancer

THE TIME FACTOR

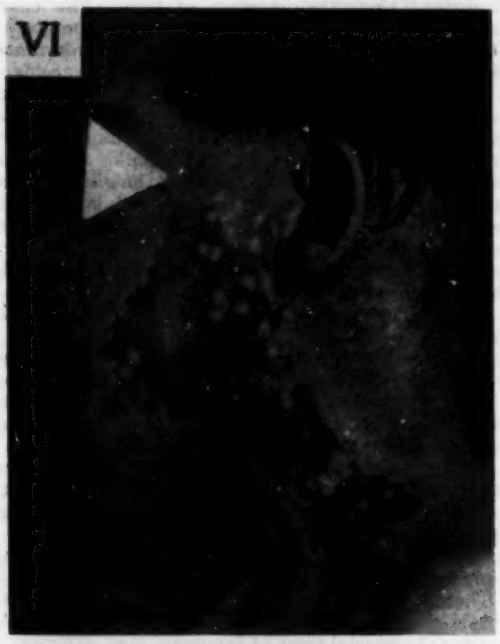
Alongside the energy factor, considered originally as the sole factor or at least essential to the X ray therapy of cancer, the daily repetition of irradiation in doses either uniform or unequal and the increase in the number of days of treatment, have provoked a second factor, the time factor. This time factor has long consisted in a chronological distribution of the irradiations so that the general and local accidents observed previously might be avoided, thanks to an increase in the difference of sensitivity between the neoplastic tissues and the normal tissues. The chronology was, above all, protective, at least in principle, for actually it did not always succeed in protecting the normal tissues against post-X ray complications. Complications and accidents in X ray therapy of cancer, when the treatment is identical, appear or do not appear according to variations in individual susceptibility. The vasculo-connective tissues are shown to be very fragile or very resistant in individual patients.

As regards the embryonic cancers, where it is sometimes possible to give treatment in short periods of from 18 to 20 days, a good chronological distribution can ensure protection to the surrounding tissues. As regards the differentiated cancers which we now treat over a long period, notably 45, 50, 60 days or more, the chronology has a different character. On the one hand, accidents to the general tissues are exceptional on account of the long time over which treatment is spread. On the other hand, disappearance of the cancer cells does not happen by cellular destruction between the eighth and twenty-fifth day, as in embryonic cancers, but by a sort of late cellular evolution, similar to the normal evolution. Between the forty-fifth and the ninetieth day we see the neoplastic masses, which have generally diminished in volume during the previous irradiations, increase anew for eight to ten days, giving the impression of a rapidly growing recurrence, then cover themselves with horny formations or glandular secretions and diminish anew in size and little by little disappear. For this slow evolutionary effect to be produced it seems necessary for the treatment to be carried out over a very long period, by means of very small daily doses. The chronology is no longer protective; it seems to be evolutionary.

CANCERS OF VERY EMBRYONIC TYPE

In the treatment of very embryonic, very radiosensitive cancers, the energy factor is predominant. The action of X rays seems to be a direct one; it is rapid; the cells die very soon and have generally disappeared towards the twenty-fifth day. The medium, the vasculo-connective tissue, only plays a very small part. Whereas it is sometimes modified by the irradiation, it is more often modified after the destruction of the cancer cells. It is possible, moreover, to find no modification whatever of these tissues. Sometimes the covering tissues reveal not a single trace of the irradiations, as if the dose delivered had corresponded exactly to the quantity of energy necessary for the destruction of the cancer cells and as if the energy was entirely utilised by these cells.

The time factor, as I have said above, enables us mainly to achieve the preservation of the general tissues and to avoid early or late accidents.



In this case radio-epidermitis appeared on the 28th day after the beginning of treatment. This photograph was taken on the 11th day of the radio-epidermitis, when repair is being accomplished by groups of epithelial cells arranged in a semi-circle at the periphery of the lesion.

Sixteenth day of radio-epidermitis. Repair goes on only from the periphery. No central islands of epithelium.

HIGHLY DIFFERENTIATED CANCERS

In the treatment of highly differentiated, radio-resistant, extensive, and deeply situated cancers it is quite a different question. The time factor is predominant. The question of energy, dose, and destructive effect gives place to the question of radio-evolution and evolutionary chronology.

The supporting tissues play a predominant rôle. The action of the X rays seems to be indirect, slow, and late. The energy carried each day to the cells ought to be feeble, since it aims at slowly bringing about the evolution effect, that is, the maturation of the cancer cells. It seems only possible to achieve this if the neoplastic cells assimilate little by little,

Thirty-fourth day. A linear cutaneous lesion remains. Very slow repair.

Forty-third day. Repair with central scar and late œdema. The duration of radio-epidermitis has been much too long.

according to their needs, part or all of the slowly delivered energy. If the energy is delivered too rapidly or in too short a time, if it is greater than that which the cells need, the excess of energy seems to be absorbed by the vasculo-connective tissue and by the general tissues. Modifications of the vasculo-connective tissue result from this and appear to reduce or annul the evolutionary process.

RADIO-EPITHELITIS OF CANCER CELLS

Embryonic epitheliomas are sometimes covered with thick false membranes some days after the beginning of irradiation. If the cancer is not infected, one can thus witness the early appearance of radio-epithelitis of cancer cells. The false membranes may be confluent from the sixth or seventh day. They therefore precede by some days the radio-epithelitis of the fourteenth day, that is to say, of the normal epithelial cells which surround the cancer. The radiosensitivity of the cancer cells is at this time definitely greater than that of the normal neighbouring mucosa. In these cases cure is usually easily obtained, even after a treatment of short duration. If the cancer cells are covered with false membranes some days after the appearance of the radio-epithelitis of the normal surrounding mucous membrane, it is because their radiosensitivity is less than that of the mucosal cells. Cure is more difficult to attain and necessitates a longer period of treatment.

Among the differentiated cancers only the stratified epidermoid epitheliomas and the cylindrical-celled epitheliomas give rise to radio-epithelitis and in an inconstant manner. When it appears it is always very late. It is produced a long time after the radio-epithelitis of the stratified mucosa which is spread between the fourteenth and the twenty-eighth day. It sometimes appears towards the thirty-fifth day, at other times towards the forty-second, and at still other times towards the fifty-fifth day, according to the type of epithelioma.

Summary

The two principal factors in X ray therapy are the energy and the time. They must be considered in their relation to the cancer cells on the one hand, and on the other hand to the vasculo-connective tissue and the general tissues of the site from which the cancer is developing.

In the course of treatment the principal guides have been, for us, the radioreactions of the vasculo-connective tissue, the radioreactions of the covering epithelium, and the radioreactions of the cancer cells.

When one is irradiating a cancer of very small size and very embryonic in type, the treatment can be completed in a short time, about 20 days; the epithelial radioreactions may be relatively intense, on condition always that their duration never exceeds 15 days.

When one is irradiating a cancer less embryonic in type, the treatment ought to be of longer duration, and the epithelial radioreactions ought to be slight.

When it is a question of a very extensive cancer, irradiated through fields of large dimension, as in the case of cancer of the uterus, the treatments ought to be from 40 days as a minimum; the cutaneous radio-epidermitis ought not to be exudative; and the radio-epithelitis of the vaginal, intestinal, or vesical mucosa ought to be very slight. Symptoms, even temporary, of cystitis, proctitis, or enteritis, ought to be avoided.

The question of energy—i.e., of the cancericidal dose—is essential in the treatment of an undifferentiated embryonic, radiosensitive cancer, and it is more important than the question of time. The energy seems to be directly destructive; the chronology is, above all, protective, since it allows the preservation of the supporting tissues in order to avoid accidents.

The question of time is more important than the question of energy in the treatment of a differentiated, radio-resistant cancer. The energy ought not to provoke a destructive effect. Thanks to a slow chronology and to weak daily doses, the disappearance of the cancer cells seems to follow a cellular evolution resembling the normal evolution. In determining the longer duration of treatment one should aim at the perfect preservation of the supporting tissues so that the evolution effect may become possible.

In conclusion, I would say that it is still absolutely necessary to bear in mind that:

1. The cure of cancer by X rays is still difficult.
2. The cure of cancer by X rays is still dangerous.
3. A very small margin exists sometimes between the dose which will determine a cure and the dose which will provoke an injury.
4. The daily examination of the patients is necessary; modification of the normal tissues and of the general condition by X ray treatment sometimes appears so quickly that it is often necessary to diminish the daily dose or the size of the fields in the course of the treatment.

There exists no fixed method of treatment but a simple clinical treatment for each individual patient and for the special type of tumour.

I would like to express my gratitude to the directors of the Marie Curie Hospital for the great honour they have done me in inviting me to speak here on the occasion of the opening of the new X ray department, and to Prof. Regaud, chief of the Institute of Radium of the University of Paris, who, for 15 years, has helped me with valuable advice. I have also to thank Dr. Jean Riach for translating this lecture.

THE DANGEROUS MULTIPARA*

BY BETHEL SOLOMONS, M.D. Dub., F.R.C.P. Irel., F.C.O.G.

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MY object in writing this paper and giving it a sensational title is to remove if possible, once and for all, from the mind of the reader the idea that a primigravida means a difficult labour but a multipara an easy one. The primigravida gives the impression of difficulty just because she is an unknown entity, and more attention is focused on her both in pregnancy and labour than on the woman who has "done it before." But it is altogether a mistake to suppose that in childbearing practice makes perfect. Furthermore, the multipara is probably more important to the State than the primigravida, and demands equal care. She is the more skilled housekeeper and she knows the weaknesses of her husband; she is the mother of one or more children, and it may be taken as an axiom that mothers cannot be replaced.

During the first four years of my Mastership, in 8333 births in the intern department of the Rotunda there were 4975 multiparæ, a percentage rate of over 59. Among them there were 34 deaths, or 0·7 per cent., and this mortality was slightly higher than that of primigravidæ (0·67). An interesting study from the Department of Health for Scotland shows

* Portion of a paper read at the fourth annual meeting of the Central Association of Obstetricians and Gynæcologists, Memphis, Tennessee, U.S.A.

that while primiparæ have a mortality 7 per cent. under the average and 2-paræ nearly 40 per cent. under, from the fifth pregnancy the rate of mortality is over average by an amount which increases steadily and speedily until in women bearing their tenth child or more the mortality is five times as high as for all women bearing children.

THE WOMAN WITH THE PENDULOUS ABDOMEN

There is no more difficult proposition in midwifery than the woman with the pendulous abdomen. First, the abnormality may be missed until it is too late to act, and secondly, the presentation may become abnormal after the time when it is possible to correct it with safety for mother and child. The possible outcomes are: (1) occipito-posterior and brow presentations due to the fœtus lying in an incorrect axis; and (2) rupture of the uterus from attrition or actually from thinning of the lower segment due to disproportion.

Contraction ring dystocia due to disharmony of the uterine muscle may be present, and may be due to what might be called natural causes, or to the administration of such drugs as pituitary extract. A strong and loud enough warning cannot be uttered against the use of this type of drug. Rupture of the uterus is common when pituitary extract is administered at the wrong time, and contraction ring may occur. Irregular contraction, with some separation of the placenta, may cause and has caused death of the fœtus.

What can we do to prevent these abnormalities when a pendulous abdomen is discovered or when the patient is seen either in threatened rupture or just leading up to it? This at first seems simple, for a tight binder should work the miracle: alas, this is not so, and danger may speedily become obvious if something is not done. In the early stages, when it is seen that the binder is not doing its job, version must be considered; in later labour version is definitely indicated and the difficulty is to decide on the best time for doing it.

If the patient is seen early, a binder is applied: the attendant should see if the presenting part is being kept in the axis of the inlet. After she has had some labour version must be done if the head is not inclined to fix: if, on the contrary, the head is fixing all will be well and vaginal delivery will be easy. It is very simple to say "perform a version," but if possible this should be left until the time when delivery can be terminated—that is, when the cervix is fully dilated. Sometimes version cannot be postponed so long and it may be necessary to perform it when the cervix is half dilated. On no account must the delivery be completed then. It may be asked if there is risk in this manipulation, and the answer is emphatically in the affirmative: there is risk to the mother if the case is left too long—that is until symptoms and signs of threatening rupture are imminent—and there is risk to the child of prolapse of the cord either during the version or afterwards. Generally speaking, however, prolapse does not occur.

To repeat, if a pendulous abdomen is discovered it must be corrected before danger sets in. This pendulosity may or may not be accompanied by such abnormal presentations as brow, persistent occipito-posterior, and face. Whether these are present or not, version is the proper treatment when the head is not engaging after some labour. I have seen contraction ring dystocia in 10- and 12-paræ, some complicated by marked asynclitism, treated successfully by version. But, on the other hand, a neglected case of this kind will often end in perforation.

A disastrous case of a 3-para illustrates so many conditions that it is mentioned here. There was warning of her trouble, for there had been a transverse presentation with neglected shoulder at the second labour. The pelvis was normal. She was seen antenatally, but it was impossible to get a polar presentation. (This was a case where prenatal care was of no avail.) Even in labour it was difficult to keep a pole down and difficult to turn. Lower-segment section was decided on, but it was found the baby was dead, so she was put back. A contraction ring occurred. It was impossible to reach the neck. The arm was amputated and threatened rupture was present. The thorax was emptied, but the version was so difficult that it took three-quarters of an hour to reach the leg. It was impossible to deliver the head without perforation, so it was delivered by means of two Schultz forceps after decapitation. This patient developed severe sepsis, which was treated by hysterectomy. A large necrotic fibroid with an abscess in the right parametrium was discovered. She recovered. Probably the fibroid was the main cause of all the trouble. Although fibroids are not very common in the very multiparous woman, they must be remembered as a possible cause of dystocia.

Such examples as a 17-para whose labours were normal until the 15th, when operative measures were necessary, and a 20-para who went into threatened rupture after 19 previous normal labours could be multiplied scores of times.

ECLAMPSIA

Some years ago it was thought that eclampsia was essentially a disease of the primigravida. We now know that the multipara is just as liable to it, and when eclampsia develops with her it is probably more dangerous than for the primigravida. It is difficult to tell the reason for this. Probably her kidneys are in a less satisfactory condition than those of her younger sister. She is nearly always comatose; often her blood pressure is quite low, and she secretes but little urine. In the last investigation made the mortality for eclampsia was 1·4 higher in the multipara than in the primigravida. Another point about the multiparous eclamptic is the atypical picture, so difficult that it is well-nigh impossible to know if the case be one of eclampsia or of something else. With the primigravida, once she is over her actual eclampsia the danger is fairly well finished. With the multipara, we often do not know where we are. The following is an unusual case, but exemplifies these remarks:—

A 3-para did not attend the prenatal department. She was admitted with a history of having had two fits. She was very restless. Blood pressure 122/70; semi-conscious. Baby stillborn. She improved after the birth but was restless and difficult to manage; 32 hours after the birth fits began again and continued despite all treatment until she had had 29 fits, when she died. The post-mortem report was atypical for eclampsia and exemplifies not only the danger of eclampsia in the multipara, but also the difficulty of determining whether a patient has eclampsia or not.

Besides eclampsia, all other varieties of toxæmia may be encountered. Toxæmic hyperemesis is a dangerous and often fatal complication for the multipara.

ACCIDENTAL HÆMORRHAGE

This is essentially a disease of the multipara; in fact, so seldom is it seen in the primigravida that when it does occur one is inclined to question the diagnosis, which is more likely to be a very heavy "show," marking the onset of labour, or a missed placenta prævia. During four years there were 148 cases of accidental hæmorrhage at the Rotunda Hospital. Of these 130 were in multiparæ. It should be possible to prevent this disease to a large extent. By getting women to attend the prenatal department regularly, the onset of the kidney condition should be diagnosed and trouble stopped. Too often, however, the patient appears absolutely moribund, with kidneys

so damaged that further metabolism is impossible. I do not intend to say anything about treatment except that sub-mammary injection of saline will often save the patient, who will die if local treatment is resorted to too soon.

CONTRACTED PELVIS, DISPROPORTION, MALPRESENTATIONS

It may seem strange that these three are considered together, but they may all occur in the labour of a multipara who has had absolutely normal births on previous occasions. On this account, therefore, she is a very dangerous multipara when any of these abnormalities happen. When disproportion occurs in the multipara the cause must be found; besides pendulosity the principal causes are contracted pelvis, large babies, and malpresentations.

There is no doubt whatever that some women grow contracted pelves or large babies as they become more multiparous. The mystery of the acquired contraction is difficult to elucidate, but it is not uncommon for a woman who has had perfectly normal confinements on all previous occasions to exhibit signs of dystocia perhaps on her eighth effort, and in Ireland "eight" is a common number, while I have seen even the 25-para on not rare occasions. At this eighth effort she shows all signs of delayed labour, and when an investigation is made it is found there is nothing wrong but a marked promontory. Whether this is due to injury of the joint from previous labours or a definite rheumatic affection is a problem; suffice it to say that these cases must be dealt with on the same lines as contracted pelvis in the primigravida.

Increasing size of the baby without change of husband is usual—a fact which was borne out by the investigation of 100 consecutive cases of primigravidæ and multiparæ taken at random. It was found that the average weight in the former was 7 lb. 6 oz. and in the latter 7 lb. 9 oz. The excessive size may not necessitate active treatment, but it may cause trouble, and it is one of the reasons for which the unwary practitioner may find himself in difficulties. This is the type of case where failed forceps and ruptured uterus may be found—the case which requires extreme patience before efforts are made to deliver; in fact, such efforts should not be made until all conditions are fulfilled whereby delivery can be performed without danger.

This is the case, too, where pituitary extract and kindred substances are dangerous, and ruptured uterus may occur when these drugs have been administered at the wrong time. A breech, either arrested at the brim or impacted in the cavity, is probably the most common malpresentation. Many times I have been called to see a very multiparous patient who has failed to deliver herself of a breech—the practitioner having tried every means he knows to help her but without success. There is no contraction ring unless he has been very vigorous in his methods; the baby is still alive. The best method of treatment is to hook the finger into the anterior groin, if necessary pulling with the other hand on the wrist. The method by which the breech is pushed up and the leg brought down has the danger that if movements of the operator are violent, harm to the extent of rupture may result. A very good plan is to put the forceps gently on the breech: traction will then bring the baby low enough to allow finger traction on the groin. If vaginal methods fail, the lower-segment section should be chosen.

Brow presentation must be sought for and treated, while face and occipito-posterior presentation may also be present.

PLACENTA PRÆVIA

Placenta prævia is not a dangerous condition and the mortality should be approximately nil. In 78 cases at the Rotunda in four years there was no death. Of these 70 were multiparæ; this is natural, for the theories of this disease all point to the multipara. In a paper read before the British Medical Association at Manchester, I suggested that the fault lay in the endometrium; that there had never been a repeat case in my practice; and that a prophylactic curettage two months post partum would prevent further placenta prævia. Since that, in collaboration with one of my post-graduate students, Dr. H. E. Canter, I have given further evidence [1] that placenta prævia can be avoided in the multipara. While in no way advocating curettage as a routine for all women with heavy menstruation, there is much to be said for it where a woman has had one or two miscarriages, followed by heavy menstruation; for this is the type of woman who subsequently has a low implantation.

The diagnosis of placenta prævia should be nearly certain without vaginal examination, and this examination should not be made until the operator is ready to perform version, if that is the favoured treatment. Under no circumstances after version should delivery be hastened in any way whatever.

ADHERENT PLACENTA

I have never seen a true case of a morbidly adherent placenta in the primigravida. Retained placenta occasionally requires manual removal because of post-partum hæmorrhage, but very seldom. In the multipara, however, adherent placenta may occur, and as this is one of the most dangerous complications of obstetrics its importance must be stressed. The danger of inserting the hand in the uterus must be especially emphasised, for infection and death are likely to follow. The morbidly adherent placenta is often accompanied by chronic renal disease, so the patient is a bad subject but, even in the absence of this, danger is ever present. May I offer a suggestion in this connexion? When the hand which has been placed in the uterus is removed, it should be reinserted to make sure the uterus is clear. This may have to be done two or three times before one is satisfied. After its withdrawal from the uterus, therefore, this hand must not be removed from the vagina until the operation is complete: in other words, the hand is inserted in the uterus, the placenta is removed, but the hand remains in the vagina.

RUPTURED UTERUS

In four years at the Rotunda there were 10 cases of ruptured uterus, nine in multiparæ; the one primigravida was a case of neglected face presentation after the use of oxytocic drugs. All could probably have been avoided either by careful prenatal care, or by carefully watching the patient in labour, or both. The reasons for rupture were as follow:—

1. The injection of 10 international units of pituitary extract for second-stage delay; this woman was a 3-para who had had two normal confinements. This illustrates the danger of pituitary extract. Even small doses in the early stages of labour predispose to contraction ring dystocia, retained membranes, and post-partum hæmorrhage. The only really safe time is after the third stage is completed.
2. A "quiet" rupture which probably followed an incomplete rupture in a previous labour.
3. Face presentation and contraction ring in a 6-para.
4 and 5. Neglected shoulder.

[1] Surg., Gyn., and Obst., 1932, liv., 790.

6. Pendulous belly. Rupture followed neglect to perform a timely version.
7. Partial rupture after a previous lower-segment section. Mother and child were saved.
8. Ruptured uterus after efforts to overcome contraction ring.
9. The uterus was ruptured at 18 weeks through faulty insertion of sea-tangle tents.
10. Pendulous abdomen in a 14-para.

FAILED FORCEPS

The practitioner who knows he should not apply the forceps before the cervix is fully dilated in the primigravida may let his conscience slide for the multipara. But let him beware: an undilated cervix, a head in the upper strait, will spell danger if the forceps are applied. The practitioner may be lucky with a few cases where he has applied the forceps too soon, but the day will come when a dead or mutilated mother and a dead or injured child will bear witness to his ignorance of the first principles of midwifery. The importunities of relations or friends constitute no excuse for the failed forceps. High forceps are always dangerous for mother and child; they should never be applied. Mid-forceps spell danger; they may occasionally be necessary. Low forceps is a safe operation.

Among the few examples of failed forceps encountered in the Rotunda, we have found that spontaneous delivery or an easy forceps delivery occurs any time from 6 to 24 hours after admission. Occasionally a lower-segment section has been necessary, and the fact must be stressed that this operation can be done after failed forceps. It is never necessary to destroy a live child.

Vaginal delivery after section is quite justifiable at the present day, but the patient who has had a section *must* be confined in a hospital with proper equipment; signs of threatened rupture in this class of case must be known; these are a red vaginal discharge accompanied by tumultuous movements on the part of the fœtus, with distress demonstrated by rapidity in the fœtal heart rate.

DRUGS

The multipara with the flabby uterus must not be given any oxytocic drug. She may develop contraction ring dystocia even after only grs. 10 of quinine. Pituitary extract and thymophysin may produce the same effect. Several cases of this kind have been admitted to the Rotunda, and A. Probstner [2] has reported five similar cases of which only one survived. It is safer for the general practitioner to reserve pituitary extract for the termination of the third stage.

CONCLUSIONS AND SUMMARY

(1) At the Rotunda Hospital the percentage mortality-rate of primigravidæ and multiparæ is about the same. As the ratio of multiparæ to primigravidæ is about 59 to 41, more multiparæ die than primigravidæ. (2) This danger to the multipara is amply confirmed by a statistical inquiry from the Department of Health for Scotland. (3) The multipara with pendulous abdomen is a grave obstetrical problem. If treatment is not carried out at the correct time dangerous symptoms may arise. (4) The death-rate for multiparous eclamptics is slightly higher than for the primiparæ. (5) Of 148 cases of accidental hæmorrhage 130 were in multiparæ. (6) A multipara with no history of previous disproportion may develop symptoms, either because of the increased size of the baby or some acquired abnormality of the pelvis in a subsequent labour. (7) Of 78 cases of placenta prævia 70 were in multiparæ. (8) Morbidly adherent placenta and ruptured uterus are conditions of the multipara. The danger of pituitary extract before the third stage has ended is great. (9) "Failed forceps" is just as likely in the multipara as in the primigravida.

[2] Med. Klin., 1930, xxvi., 1785.

OBSERVATIONS ON ROSACEA

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In spite of a number of important investigations on the pathogenesis of rosacea, its ætiology remains obscure. During the past decade or so the most noteworthy additions to our knowledge of the malady have been from Barber and Ryle,[1] Brown,[2] Eastwood,[3] and Stokes and Beerman.[4] The work of these observers seems to point to some gastric fault in rosacea—most probably a low gastric acidity—but all appear to agree that this factor alone is insufficient to account for the complexities of the disease.

Numerous morbid conditions have been considered important predisposing factors in rosacea—e.g., focal sepsis, constipation, intestinal putrefaction, intestinal worms, acute infections of the respiratory tract, chronic worry, the menopause, and certain gynæcological disorders. But amidst all this confusion, the gastric factor seems to stand out as of major importance, and this is confirmed both by the history of the average rosaceous patient and by results of treatment.

The typical patient with rosacea is a middle-aged woman who has had chronic "indigestion" for many years. (The term "indigestion" may be taken to cover a whole gamut of symptoms referable to the stomach.) During this period there has been an insidious onset of the features of the disease. A flush, at first restricted to the post-prandial period, later becomes permanent and may be accompanied by pustulation. The indigestion usually antedates the rosacea and, when the gastric symptoms are prominent, this is aggravated. Conversely, if the indigestion is cured, the face tends to get well, although there may remain a permanent capillary dilatation.

Barber and Ryle [1] in 1920 investigated the gastric function of some cases of rosacea by means of the fractional test-meal. Comparing their results with the normal controls of Ryle and Bennett,[5] they came to the conclusion that low gastric acidity was common in these patients. Eastwood [3] and Brown [2] independently confirmed these results, although their findings were not so impressive as those of the original observers. This low gastric acidity was apparently confirmed by the dramatic results often obtained by the exhibition of dilute hydrochloric acid by mouth, the flushing and indigestion both tending to disappear rapidly. Eastwood pointed out, however, that the results of giving acid could not always be correlated with the test-meal findings and that some cases with normal test-meals responded well to acid by mouth. We, too, have noted the dramatic improvement with acid in three cases of rosacea in which the test-meals showed hyperchlorhydria in two instances and normal acidity in the other. It therefore becomes obvious that the response to acid cannot always be explained by the existence of low stomach acidity.

With these views in mind we have studied 40 cases of rosacea during the past year, taking careful histories in each. On the assumption that the gastric fault is the prime factor, we investigated these patients not only by means of fractional test-meals but also by a small series of histamine test-meals, correlating our results with the results of treatment and with the findings on physical examination. Of our 40 cases, 33 were women. The ages of onset ranged from 18 to 68, but the majority of the ages of onset lay around 35 years. Most of the women were married and had had children; many of them had those two curious and well-known findings in rosacea—low blood pressure and cold extremities.

CIRCULATORY DISORDERS

Rosaceous patients tend to have cold hands and feet, often accompanied, in the female sufferers, by "dead" or "white" fingers. The latter is a phenomenon related to Raynaud's disease. Exposure to cold induces whiteness or numbness; as the circulation recovers the fingers become blue or cyanotic before resuming their normal colour. The phenomenon may last a few minutes. "Bad peripheral circulation" has been noted by MacLeod [6] in these patients but, although it is common in rosacea, it is not invariable. "White fingers" occur frequently in non-rosaceous women and in some non-rosaceous asthenic men. A poor peripheral circulation may be found in rosaceous subjects with normal systolic blood pressures or with low pressures. It may also exist in those with hyperchlorhydria and those with hypochlorhydria. As far as we observed, the white fingers and cold extremities go on even when the rosacea and the indigestion are materially improved.

We examined the nail fold of a few of these patients under the capillary microscope. There appears often to be a marked dilatation and even tortuosity of the venous side of the capillary loops. Often, too, there was a terminal "knob" or aneurysm on the convexity of the loop. These changes seem to occur in the winter and to disappear in the summer, but we have made too few observations to do anything more than mention these results. During the winter there is a small exudation of serum from the skin capillaries of the hands of these patients, and this gives the skin of the hands a slight thickening, especially over the knuckle folds of the proximal interphalangeal joints. On the whole, the bad peripheral circulation seems more a background to the disease than the disease itself, but it is undoubtedly of some importance in the ætiology, for it is observed more often in rosacea than in most skin diseases.

As is well known, about a quarter of the cases of rosacea have a low systolic blood pressure for their ages. The lowest systolic blood pressure in our series was 100 mm. Hg. Low blood pressure is, however, not an essential feature of rosacea; indeed, we have notes of one case with a systolic pressure of 180 and of another with one of 200. The blood pressure bore no relation to the gastric acidity or to the severity of the rosacea in our series; neither did the presence or degree of the coldness of the extremities bear any relation to the severity of the rosacea, the gastric acidity, or the blood pressure.

SEXUAL AND ENDOCRINE FACTORS

Dysmenorrhœa was conspicuous by its absence in our series. One patient did complain of a "terrible" pain at the periods, but her neurotic nature made us suspect her statement. The following menstrual irregularities were noted: oligomenorrhœa, 2 cases; irregular periods, 1 case; imperforate hymen, 1 case.

The premenstrual exacerbation of rosacea is an interesting subject for speculation. One observant mother told us that her daughter's rosacea began to get worse 14 days before the monthly period, and was at its worst a day or two before the period began; there was amelioration during the actual period. Now, those cases of rosacea which get well with treatment—say with hydrochloric acid—no longer experience any exacerbation during the premenstruum. It is reasonable to assume, therefore, that the action of the premenstruum is to aggravate the gastric fault in most cases and that the premenstruum is without influence when the gastric fault is removed or corrected. If this were not so, and were the action of the premenstruum independent of the gastric factor, one would expect its action to persist after the gastric fault had been corrected.

In some of the irregular bleedings that occur round about the menopause the face is worse with the uterine loss. Why this is so is obscure. Some of the irregular and excessive bleedings of the menopause are associated with cystic follicular ovaries with an excessive formation of œstrin. It is possible that the connexion may be in this factor.

We treated three patients (one a young girl) with injections of ovarian follicular hormone. We used both Theelin (P. D. & Co.) and Oestroform (B.D.H.). The former we administered in bi-weekly doses of 50 rat units and the latter in bi-weekly doses of 1000 and 2000 B.D.H. units. The treatment, in two cases, was supplemented by oral administration of Oestroform tablets and was continued for three weeks. Although we provoked menstrual bleeding in one case previously amenorrhœic, we noted no improvement in the rosacea on this treatment; indeed, after the cessation of treatment, two of the cases seemed to settle down to a natural recovery.

In very many cases of "menopausal rosacea" there has been indigestion for a great many years before the menopause, and the latter seems to act more in the nature of "the last straw" than as a direct cause of the rosacea. It is probable that the menopause merely aggravates the gastric fault and is therefore quite a secondary matter. In three cases we noted that, although indigestion had been present for ten and even twenty years, it was the advent of the climacteric which precipitated the rosacea. In this type of case the rosacea usually begins before the periods have ceased.

EYE DISEASES AND OTHER CONDITIONS ASSOCIATED WITH ROSACEA

The usual ocular lesions are: (1) dilatation of the conjunctival vessels—i.e., rosacea of the conjunctiva; (2) rosaceous phlyctenular conjunctivitis, usually seen on the margin of the limbus and resulting in a leash of conjunctival vessels leading to the phlyctenules; (3) corneal ulceration resulting from the breaking down of the phlyctenules; (4) meibomian cysts; and (5) keratitis. In our series 6 cases had eye lesions, which were as follows: "eyes have been inflamed"—meibomian cyst (1 case); rosaceous phlyctenular conjunctivitis (1 case); corneal ulcer (3 cases); corneal ulcer and phlyctenular conjunctivitis (1 case).

If the face and indigestion respond to treatment the eyes will usually follow suit, but where there is long-standing corneal ulceration the issue is not so simple. One patient had a deep and active corneal ulcer on the right eye, while on the left eye there was simple dilatation of the ocular and palpebral conjunctival vessels. This dilatation was made much worse with acid (as were the dyspepsia and the rosacea) but had practically gone after four days on a bismuth and soda mixture alone, which suited his

indigestion and rosacea equally well. Of the six rosaceous patients with ocular lesions, five were women and one was a man.

The eye lesions are possibly of the same nature as those on the face; it is unlikely that they are embolic in origin, as in tuberculous phlyctenular conjunctivitis. The rosaceous phlyctenules, on section, are said to be a collection of round cells. The most probable explanation is that the process is a low-grade pyogenic infection. Apparently the meibomian cyst is not a true cyst but more in the nature of a low-grade chronic inflammatory reaction. The eye lesions usually occur after the rosacea develops, but in two of our series the eyes were affected first. The associated diseases which came to light in the course of the case-histories while we were searching for any possible common factor in our series were very various.

1. Acne vulgaris (3); a history of acne was obtained in one case. Acne scars are rare in these rosaceous patients; in most cases the complexion has been good until the advent of the rosacea.
2. ? Subacute appendicitis (1); recent operation for acute appendicitis (1).
3. Migraine (2).
4. Recent pleurisy with effusion (1); tuberculous peritonitis in childhood (1).
5. Rodent ulcer (nose) (1).
6. Psoriasis (1).
7. Diabetes (1).
8. Hypothyroidism (1).
9. Alopecia areata (1).
10. Cystic cavity in scaphoid (1).
11. Rheumatism and vague history of chorea (1).
12. Vague fibrositis (2).
13. Osteo-arthritis (5), most of them being of the climacteric type.
14. "Rheumatism in fingers and ankles" (1).
15. Hypertrichosis (2).

TEST-MEALS

Fractional test-meals were done in 14 cases and the results were as follows:—

	Cases.
1. Practically complete achlorhydria ..	1
2. Hypochlorhydria	2
3. Low normal acid	2
4. Normal acid	4
5. Hyperchlorhydria	4
6. Climbing HCl	1

Two cases of hyperchlorhydria, one case of climbing acid, one normal acid curve, and one low acid curve had delay in emptying. Excessive mucus was present in only one case—that which was almost achlorhydric. In no case amongst those with low acidity was the latter explicable by early duodenal regurgitation, as judged by the presence of bile.

Eleven histamine test-meals were given, including three cases which had previously had the ordinary fractional meal. These three cases, as judged by the ordinary meal, had hyperchlorhydria, normal acidity, and low normal acidity respectively. It was thought that the administration of the histamine for the purpose of extending our knowledge of the gastric fault in rosacea would also allow us to study the effect of the drug on the flushing of these patients. Ergamine acid phosphate, 1 mg., was injected under the skin of the forearm. The flush developed in four minutes in the rosaceous areas and then spread all over the face and neck, being accompanied by a throbbing headache. In women, a blotchy redness developed over the neck and upper part of the chest more or less concurrently with the rosaceous flush, until finally the whole exposed part of the head and neck was involved, down to the V-shaped "blouse area." The flush persisted from one-quarter to three-quarters of an hour, and always lingered in the atonic dilated capillaries of the rosaceous area, although it had faded elsewhere. Only one patient, who had hyperchlorhydria by fractional test-meal, did not flush at all with histamine.

The test-meal findings, both histamine and fractional, were, as far as they went, such as would be found in an unselected group of normal individuals of the same age-period. There is therefore very little evidence of any fault in gastric secretion in most cases.

It will be seen that our fractional test-meals (14 cases) gave only one case of achlorhydria—i.e., 7 per cent. Brown [2] found 14 per cent. and Eastwood 8 per cent. achlorhydria in their series of rosaceous patients. Dahl-Iverson, quoted by Connor,[7] gave the following figures for test-meals in normal subjects:—

Age.	Subjects.	Achlorhydria %.
20–30	16	—
30–40	46	9·0
40–50	29	3·5
50–60	26	19·0
60–70	11	37·0

In a review of 3381 fractional test-meals on patients with normal gastro-intestinal tracts, Vanzant, Alvarez, Easterman, Dunn, and Berkson [8] found that achlorhydria increased with age, rising from 4 per cent. at the age of 20 to 26 per cent. at 60, the average incidence being 12·1 per cent. It was further observed that females were more liable to achlorhydria than males. Apperley and Semmens [9] found achlorhydria in 30 per cent. of healthy female students.

The above figures show that in rosacea there is no appreciable departure from the normal in the incidence of achlorhydria, and the latter can be taken as a much better guide to gastric secretory dysfunction than mere subacidity, which is, according to some observers, a common finding in any group of women.

We conclude, therefore, that there is no real evidence of any constant abnormality in the gastric secretion of rosaceous patients. That there is not an active gastritis is suggested by the symptoms, for rarely is there pain or irritation from eating meat, fruit, pips, rough vegetables, or any other foods which would irritate an inflamed surface. Further, the indigestion can continue for as long as ten years without alteration in the test-meal.

GASTRIC TONE

The two things that rosaceous patients cannot tolerate are white bread and very heavy meals. Although white bread is badly tolerated, toasted brown bread is usually well borne. In this connexion the observations of Lehman and Gibson [10] are interesting. They noticed, in a patient with a jejunal fistula, that when toast was eaten only a small amount of liquid material appeared at the fistula, but that when white bread was taken, large, doughy lumps as big as a pigeon's egg were passed.

The intolerance to white bread we consider to be the result of the distension of the hypotonic gastric musculature, which we believe to be the essential cause of rosacea. We noted delay in emptying in five of our fractional test-meals, and Eastwood [3] observed the same feature in many of her cases. Eastwood concluded from her radiographic studies in rosacea that gastric hypotonicity was common although not universal. We have also noted that, in two cases of hyperchlorhydria and in one case of normal acidity, both the rosacea and the indigestion were relieved by 30 minims of dilute hydrochloric acid by mouth. This suggests that the benefit of acid therapy lies not in the fact that it is a substitute

for missing acid, but that it stimulates gastric tone and peristalsis.

Wingate Todd,[11] experimenting with several hundreds of normal students by means of gastric radiography, found that gastric peristalsis was stimulated by lactic acid, buttermilk, alkalis, and tincture of peppermint. The effect of these was well marked, and peristalsis was slow, regular, and deep. Now the sensation in any hollow, muscular organ is an expression of the tension in its muscular coat, and if that organ is hypotonic—as the stomach has often been shown to be in rosacea—it would be much more likely to give expression to its "feelings" after meals heavy in total bulk or in carbohydrate content. This increase of tension in the gastric muscular wall is interpreted by the patient as a feeling of distension or "wind." That this sensation is not actually due to gas is demonstrated by the well-known observation that patients viewed under the fluorescent screen after a barium meal often complain of distension by wind when there is no obvious enlargement of the gastric air-bubble.

Not only does the stomach tend to be hypotonic in rosacea but so also are many of the other muscles, voluntary and involuntary. Barber and Ryle [1] noted the broad, flabby tongue; Rulison [12] observed the poor tone of the abdominal muscles; Eastwood [3] commented upon the low blood pressure; and many have found constipation. The entire absence of any dysmenorrhœa in these patients may depend upon a certain uterine hypotonus. That a large meal causes gastric discomfort in rosacea is in accordance with Wingate Todd's observation that a large barium meal inhibits peristalsis for some considerable time.

The rosaceous reflex must depend on increase of tension in the gastric muscle. Any factor which distends the stomach, which inhibits or flurries peristalsis, or which delays emptying, causes an increase of tension in the muscle and will call forth the rosaceous reflex in a predisposed subject. If this fact is accepted, many of the obscure associations of rosacea can be explained. It accounts for the painful conditions in the alimentary tract; it explains why adverse psychological influences, chronic illnesses, and the menopause can be causative factors.

Wingate Todd [11] noticed that prolonged anxiety caused complete inhibition of all gastric peristalsis and that at the same time there was marked hypotonicity. It is undoubted that painful intestinal or abdominal conditions and many general illnesses cause the same state of affairs. The same observer found feeble peristalsis and hypotonicity in female students during the premenstruum, and this phenomenon ceased when the flow was established. It is certain that anything which makes the indigestion worse will also increase the rosacea, and that the converse is also true. We regard this rosaceous reflex secondary to increased gastric tension as the primary factor in rosacea, for if the gastric neurosis is remedied neither the premenstruum nor any other factor has any influence in aggravating the rosacea. The adverse influence of these factors on the gastric musculature is counteracted by the therapeutic stimulation of the stomach by acids, alkalis, or carminatives; and good, slow peristalsis and good tone will relieve the tension of the stretched hypotonic muscle. Poulton and Stewart [13] have shown that the discomfort associated with distending the stomach by a compressible rubber bag is relieved momentarily when a wave of peristalsis takes the tension off the stretched nerve-endings in the gastric muscle. Similarly, when we give medicinal stomachics to a dyspeptic patient with rosacea, we are protecting the nerve-terminals in her gastric musculature by making her stomach achieve normal tone and good, deep peristalsis.

Of course, the normal reflex of slight increase of face temperature on taking hot fluids is naturally much exaggerated in the atonic capillaries of rosacea. The vasodilatory effect of alcohol and the nasal rubor of acute nasopharyngeal infections is similarly exaggerated in the rosaceous subject. The drinking of alcohol and tea (the latter regarded mainly as a hot fluid apart from a possible direct gastric irritant) therefore merely aggravates the normal reflex and cannot be regarded as a direct cause of rosacea.

Rulison's suggestion is probably correct, that the true place of gastric stimulants, such as mustard and curry, in rosacea is that such aids to digestion are needed by these patients and that unconsciously they are treating themselves. After all, therefore, the acids, alkalis, and carminatives which we administer are to these people merely very effective but rather unpalatable condiments. We provoke efficient gastric peristalsis and tone, and if the gastric acidity is not too high the best condiment appears to be 30 minims of dilute hydrochloric acid with meals; but if the acidity tends to be too high or normal, we run the risk in most cases of abolishing peristalsis and of making both the rosacea and the indigestion worse. This we have observed ourselves on many occasions. There are, however, a few patients with hyperchlorhydria (as we noted above) who can either rapidly dilute the excess acid, or perhaps neutralise it in some way, and in these cases the rosacea and the indigestion are benefited by acid therapy.

TREATMENT

The treatment of the malady is, then, obvious. The following adverse influences on gastric peristalsis should be looked for, and, if possible, remedied: (1) "nervous strain," by which one means any predisposing cause of a psychogenic nature; (2) painful abdominal conditions; and (3) chronic diseases or infections. As to diet, nothing but the avoidance of big meals, especially when taken under emotional stress, and of white bread, is necessary. The best bread to take is toasted brown bread. Luminal, bromides, and psychotherapy may have their uses in improving the all-important psychological factor. An adequate amount of post-prandial rest and exercises will remedy the tone of the muscles.

It is of value to have a test-meal done, in order to see whether the gastric acidity is too high to attempt giving 30 minims of dilute hydrochloric acid by mouth in water with meals. This should be tried, even if the gastric acidity is high, for a day or two. Otherwise peppermint, alkalis, or menthol are the best condiments to administer before meals.

Some patients recover if they are removed into better surroundings, or if their financial circumstances improve, but in a great many cases the provoking factor is irremediable, and has to be counteracted by nerve sedatives and medicinal stomachics. There should be great scope for psychotherapy in these patients.

SUMMARY

(1) The gastric acidity is practically within normal limits in rosacea, as demonstrated both by the ordinary fractional test-meal and by the histamine test-meal. (2) The rosaceous reflex is induced by an increase of tension in the stomach wall. (3) This increase of tension may be due to one or more of the following factors: (*a*) delay in emptying, (*b*) feeble peristalsis, (*c*) an easily distensible stomach due to hypotonia, (*d*) over-rapid peristalsis, and (*e*) gastric spasm. (4) The action of hydrochloric acid, alkalis, and carminatives in rosacea is to give slow,

deep, unflurried gastric peristalsis, and good muscular tone. The gastric tension is thereby relieved, the indigestion disappears, and the vasomotor reflex of rosaceous flushing depending on the tension is inhibited. (5) The gastric neurosis is due to many causes, amongst them being adverse psychological influences, poor general muscular tone, and reflex effects from disturbance in an abdominal viscus. In a few cases the reflex may be from a lesion in the gastric mucosa itself—i.e., gastritis or ulcer.

In conclusion we must express our indebtedness to Dr. Barber and Dr. Forman, both for their helpful suggestions and stimulation and for their permission to publish these observations on their patients. Our thanks, too, are due to Dr. L. J. Witts [14] for his expert advice on the histamine test-meals and on other points.

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REFERENCES

1. Barber, H. W., and Ryle, J. A.: THE LANCET, 1920, ii., 1195.
2. Brown, W. H.: Brit. Jour. Dermat. and Syph., 1925, xxxvii., 213.
3. Eastwood, S. R.: Ibid., 1928, xl., 91 and 148.
4. Stokes, J. H., and Beerman, H.: Arch. Dermat. and Syph., 1932, xxvi., 478.
5. Ryle, J. A., and Bennett, T. I.: Guy's Hosp. Rep., 1921, lxxi., 286.
6. MacLeod, J. M. H.: Diseases of the Skin, London, 1920, p. 811.
7. Connor, H. M.: Jour. Amer. Med. Assoc., 1930, xciv., 606.
8. Vanzant, F. R., Alvarez, W. C., Eusterman, G. B., Dunn, H. L., and Berkson, J.: Arch. Internal Med., 1932, xlix., 345.
9. Apperley, F. L., and Semmens, K. M.: Med. Jour. Australia, 1928, ii., 237.
10. Lehman and Gibson: Quoted by Alvarez in the Mechanics of the Digestive Tract, New York, 1922.
11. Todd, T. Wingate: Behaviour Patterns of the Alimentary Tract, Baltimore, 1933, p. 79.
12. Rulison, R. H.: Amer. Jour. Med. Sci., 1927, clxxiv., 60.
13. Poulton, E. P.: Taylor's Practice of Medicine: section on digestive tract, London, 1930.
14. Witts, L. J., and Hartfall, S. J.: Guy's Hosp. Rep., 1933, lxxxiii., 3.

PSYCHOLOGICAL EFFECTS OF BODILY ILLNESS IN CHILDREN

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THOUGH it is only to be expected that children, in keeping with their sensitiveness to early experiences, will be affected psychologically by bodily illness, this aspect of child psychology seems not to have been dealt with in any article or book. With adult patients, as every doctor knows, illness is often responsible for an exaggerated selfishness and an unmistakable childishness in their behaviour to those tending them. It remains to be generally recognised that the dispositions of sick and invalid children may be subtly and profoundly changed in ways which may persist after convalescence and even throughout life. But since these changes are usually gradual, and a child is hardly able to speak of them, they are not often understood by the parents and are rarely attributed by them to their real origin.

To glance first at the notions which children shape for themselves about illness. It is beyond them, of course, to formulate the explanation which science provides—e.g., that diseases are produced by germs—and their ideas pass through two stages. When very young they believe that illness, with its pain and discomfort, is caused by some living being in themselves—some horrid little man or animal, gnawing and biting at their insides. Later, and for a good many years, they regard illness as a punishment. This they suppose can only be in connexion with something wrong they have done, and their feelings of guilt come into close relation with their notions about illness. In these two levels of ideas may be recognised the stages in the evolution of primitive society: first, the animistic explanation of the universe, and later its religious interpretation, when illness is regarded as inflicted by God by way of punishment for evil living.

BRIEF ILLNESSES

A not unusual effect of a temporarily incapacitating illness is to retard a child's mental development, and even to produce in a younger child an obvious regression of character and intelligence. This is accounted for in part by its restricted activities, but also by certain features of a sick-room. By confinement to bed the child experiences anew the life with which it was familiar in its cot during its first years. Again, in sickness a child is permitted to do little or nothing for itself, and, being tended by its mother, readily slides back into the mental state of its early helpless years. Yet again, its diet is probably restricted to milk—its food during its first years—and this, too, helps in making it babyish again.

With briefer illnesses the retarded development may be noticeable only for a few weeks afterwards, but in others the psychological effects may be more lasting, and may continue even into adult life, for example when the illness has been accompanied by suffocative symptoms. These are always peculiarly terrifying to children, and may leave behind a morbid fear of suffocation. An attack of pneumonia may be the exciting cause, though a severe sore-throat or even adenoids, by obstructing the air-passages, is often responsible.

Another effect is to intensify the fear of death. Sick children readily become troubled by this fear, and this may explain otherwise perplexing details in their behaviour. In cases of heart disease especially the fear may grow to large proportions. Children with this disease seem to acquire early the knowledge that it is often fatal, even suddenly fatal, and their concern about themselves may be very real. Sometimes this information has come by reading, or it may have been imparted by another child; but often it is overheard by chance. Doctors themselves, in the remarks they let fall in a child's sick-room, do not always remember how alert a child's ears can be, and how readily a casual word may be picked up and become the source of a secret fear for years after. Not a few healthy adults who, as children, were the suspected subjects of heart disease, go about in fear of dropping dead, because of a whispered conversation, overheard or half-heard, between doctor and mother.

An interesting effect of illness to be noted in "nervy" children is that not a few of them are speedily relieved of their neurotic symptoms when confined to bed. These are the cases in which the nervous trouble is bound up with jealousy of a brother or sister in the mother's affection. Illness secures to the invalid something of a monopoly of the mother's care and attention; for the time being the jealousy is allayed, and with it the nervous symptoms.

Psychological changes may also follow a surgical operation. All too often children are operated on without a word of preliminary explanation, even from those they trust. Indeed parents and others may conspire to keep a child in ignorance; or, worse, will deceive it by lies. The experience is usually neither forgotten nor forgiven by the child. It feels betrayed

by those whom it loves best, and henceforth a barrier of mistrust is likely to stand between it and its parents. Another common effect of an operation is to leave a child frightened, even terrified, not only about doctors but in its everyday life also. Many a child has had its normal, happy self-confidence permanently changed to fear and timidity after taking part in a "field-day" at a hospital throat department, where tonsils are removed wholesale in a scene of blood with children crying and vomiting all round. Or again, to operate without an anæsthetic, in the mistaken belief that a child feels little and notices less, has often been the occasion of a deep-going emotional shock. On the other hand, an anæsthetic given unskilfully may make a child think it is being deliberately suffocated, and the terrifying effects may be lasting. The dread of anæsthetics felt by many adults may sometimes be traceable to a single experience of this sort in childhood.

In cases of accident children are quick to fear that they are going to die. Without a prompt word of reassurance from doctor or relative, they may be left with an exaggerated fear of death; and this for years to come may baulk them in many of their activities, including school games which involve any risk to wind or limb. On the other hand, a minor accident may be as enjoyable to a child as a minor illness. A boy, for example, with a hurt hand or head, who has to wear a bandage which others can see, may feel as happy and proud as a national hero. Nevertheless, the psychological shock following a serious accident may be deep and lasting, as the following example shows.

Perhaps the severest civilian case of shattered nerves in my experience is that of a man in his twenties who shook incessantly from head to foot; he lacked self-confidence, avoided all social relations, and shunned every responsibility. A thin scar across his neck from side to side helped to elicit the history of the event that shattered his nerves. He was an only child, and one night when he was about eight his mother, a widow, committed suicide, having first come to him asleep in his room and attempted to kill him by cutting his throat. Any more devastating experience for a child could hardly be imagined, for, apart from tragically losing his surviving parent and in addition to his attempted murder, he lived to realise that it was the one he loved best in the world who had intended his death.

When convalescence begins after an acute illness children are often irritable. This is an expression of ennui felt by a child whose energy is returning faster than the restrictions on its activities are relaxed; and once the child is up and about the irritability soon goes. Most children are glad and eager to resume an active life, but some really enjoy being ill—once the worst is over—and may be little disposed to hasten their convalescence. The outstanding advantage in prolonging their recovery is to continue, if at home, to preoccupy their mother's attention to the exclusion of the rest of the family, and if in hospital, to be spoiled by the nurses.

CHRONIC AFFECTIONS

It is in chronic infirmities of any kind that the most insidious and deep-going effects may be traced, so considerable is the interference with a child's normal daily life. Common examples of these chronic conditions are infantile paralysis, depriving the child of the use of one or more limbs; heart disease, severely handicapping its activity; congenital deformities like club-foot; and the crippling tuberculous disease of joints or spine which entails confinement to bed for perhaps months or years. In addition, facial disfigurements, such as congenital nævus (port-wine stain), hare-lip, and squint, by being noticeable by everybody, often react on a child's mentality; while even defective sight, when glasses are worn, may have a similar psychological effect. Any child with a chronic disability feels first and foremost that he is different from other children. He sees himself as in some way marked off from them, and of course his life may actually be solitary. Moreover, enforced inactivity may always be there to make him realise that he is not as others.

Of all the harmful effects perhaps the most frequent is an inferiority complex. This arises partly from the fact of the disability itself, which tells the child beyond any question that he is inferior in certain respects to other children; but even more it takes origin in his sense of guilt, and his line of argument seems to be the following. Illness is a punishment for wrongdoing and sin. Since then he is being punished in this way, he believes he must be wicked, though just what his sin is he has little idea. The acceptance of the belief, however, leads to mental depression, usually with periods of remorse in which he fervently wishes he could undo his offence. Nevertheless, alongside this runs another line of thought, when he assures himself that he is innocent of any wrongdoing. As the next step he begins to feel he has been punished unjustly, and regards himself as the innocent victim of the world around him. His hostility is roused against God and especially against his parents. His feelings against the latter become all the intenser when he reflects that it is to them that he is entitled to look for protection, and that, by having failed to safeguard him against his physical disability, they have served him very badly indeed. He comes to blame them for his infirmity, and as he settles to a more or less sustained antagonism, the whole atmosphere at home is changed. And yet, as he is almost certainly unable to put his grievance into words, his parents are little likely to be able to do anything to remedy the unhappy situation. Much more probably their own unfriendliness will be stirred against their tiresome, provocative child. In the end, and most damaging of all, he is driven to the conclusion that on account of his wrongdoing he has become unlovable by his parents; and nothing so undermines a child's self-confidence as the belief that he is unworthy of love.*

REACTION OF SUPERIORITY TO INFERIORITY

An inferiority complex may come to be replaced by a superiority complex. We know that some traits of character arise as "reactions" to existing traits of the contrary kind. For example, the feeling of sympathy, which is lacking in very young children, appears later as a reaction to the impulse of cruelty which is implanted even in infants; or there is the well-known instance of the Athenian, Demosthenes, who grew up with a bad stammer but became the greatest orator in ancient times. Similarly a child with an inferiority complex may later develop a superiority complex, endeavouring in this way to bolster up his self-confidence by hiding his inferiority under a show of loud and perhaps aggressive superiority. A similar reaction to a physical handicap may of course be widely seen in adults who are undersized (dwarfs especially), misshapen, or very ugly. With these the feelings of superiority often take the form of obvious conceit.

Another common harmful effect is a super-

* And, let it also be said, nothing so ensures a child's self-confidence as the knowledge, sustained by a not too infrequent expression of the fact, that he is loved by his parents.

sensitiveness to a physical defect, especially one like a club-foot or a birth-mark on the face, that can readily be noticed by others. Byron the poet was born with a club-foot to which he grew up so sensitive that even at the height of his fame he would not willingly have it noticed; and at social gatherings he would arrive early and take up his position in the room, so that the other guests might not see him limp. Not all children, however, are sensitive in this way, and young men with club-foot are known to me who are troubled by it not at all. Equally I have known two young women whose faces were disfigured by birth-marks; one of them had grown so sensitive about it that she avoided social relations and went out only after dark, while the other contentedly followed an everyday life.

It seems, therefore, that the deformity itself cannot be responsible for supersensitiveness, and that for the explanation we must look deeper. The psychological reaction in these cases depends on the child's sense of guilt. If this is exaggerated, it readily attaches itself to the idea of a bodily defect, and the child grows morbidly sensitive about it. These feelings of guilt are held to originate in an over-strict unbringing by the parents in the earliest years, especially in the matter of masturbation. Though this is a natural habit in children, the more they are shamed about it by their parents the stronger becomes their sense of guilt.

Invalidism may be responsible for undue selfishness, perhaps associated with self-assertiveness, in a child who has been pampered on account of ill-health. Such children when they grow up must share the fate of all egoists, and suffer many a hurt to their feelings from a seemingly unkind world. Similarly, self-pity may result from invalidism. As a form of masochism, it is a normal ingredient in child character and is often, of course, to be recognised in adults; but the intensification of it in a child as a result of illness, and especially of numerous illnesses, is generally attributable to mishandling by too sympathetic parents.

Yet another harmful reaction is jealousy directed against children who are fortunate enough to be sound in health. This, too, may lead to a sense of grievance which tends to set the child against the whole world. This embitterment on the one side is only too likely to provoke hostile feelings in the other members of the family, and things may go from bad to worse. Again, the position that is now brought about is that in which the child perceives that it is not loved, and it retaliates by indulging in deliberate naughtiness in the hope of annoying its parents—the situation which must have been in Shakespeare's mind when he made the hunchback Richard III threaten, "Since I cannot prove a lover... I am determined to prove a villain." By the time a child has settled down to prove itself a villain in its parents' eyes it has said good-bye to its happiness, and it may well grow up to display the same disagreeable character to the world in general. Not a little of the gratuitous offensiveness, and even worse, that is met with in adult life originates in this childhood experience of not being loved.

Even a child who is strong and healthy may easily become convinced to the contrary if he has a mother of the fussing type. Such a mother is for ever worrying and taking precautions lest her child should fall ill, until in the end the child is unable to believe that he is any but a poor creature to be shielded from the ruder blasts of life. Many of the healthy men and women who are convinced that they are "delicate," and accordingly plan their daily lives on semi-invalid lines, owe their erroneous belief to mothers of this kind.

This point is well illustrated in the following incident. A mother brought her girl of three—an only child—to me with a covering letter from her doctor saying that though he had repeatedly been called to see the child he had never detected anything amiss, and as the mother seemed dissatisfied on this account they had agreed to take a specialist's opinion. My examination equally disclosed nothing wrong, physically or psychologically; the child in fact was an exceptionally fine specimen, and one of whom any parent might well be proud. But on my breaking this news to the mother, her instant rejoinder was, "Oh, but how dreadful! I'll have nothing to worry about."

Not all mothers, however, fuss over their children, even the sick ones. There is a sort of mother who firmly makes it her business to discourage "going sick" as a weakness, if not a crime, and in her Spartan home a child hardly dares to speak of its genuine aches and pains.

SECONDARY GAIN

A very familiar aspect of neurotic illnesses in adults is known as "secondary gain": it is the utilisation by neurotics of their nervous disabilities in order to gain some advantage for themselves, such as evading disagreeable duties. The motive is also to be found in children. One child uses its physical disability to secure an extra share of parental affection, especially in rivalry with any brothers and sisters. Another endeavours—often successfully—to make itself the centre of family importance. Another, again, turning its disability to selfish ends, tries to get its own way by playing on its mother's feelings with a threat of another attack of its symptoms, whatever they may be, unless it is given in to. In this way it not infrequently succeeds in dominating her altogether. Yet another manifestation of this secondary gain is, as with adults, in escaping unpleasant tasks such as going to church or to school.

Finally, not all the effects of invalidism are necessarily harmful, and a few of them can fairly be entered on the credit side. For example, a child with some lasting disability, gradually realising that neither cure nor relief is possible, may develop an exceptional fortitude of character which is likely to be an asset to it in later life. Again, physical inactivity tends to make a child indulge unduly in phantasying—a habit which, though it favours the development of a dreamy and unpractical nature, also provides exceptional opportunity for ambitious phantasies; and these may remain as a powerful driving force behind its adult enterprises. The association of physical inactivity with phantasying favours also the growth of the contemplative faculties, with an outcome that may sometimes be seen in the later choice of a vocation such as authorship or art.

THE ATTITUDE OF PARENTS AND TEACHERS

This brief survey would be incomplete without recognising that the subject has another side—namely, the emotional reactions of adults themselves to bodily infirmity in children. The usual effect in parents is to quicken their sympathies and so increase their love and concern for their infirm child. The risks inherent in this have already been indicated. In other parents, however, the reaction is one of disappointment that a child of theirs should be physically unsound. Their self-esteem is hurt, and they become, if only unconsciously, ashamed of their offspring, and treat it accordingly. Sometimes this disappointment leads to an active dislike of the child. As part reason

for this there may be the expenses of the child's illness, entailing personal sacrifices by the parents; but in addition their sadism is likely to be provoked, and their attitude to the child is one of unkindness or even cruelty. Yet another reaction of the parents may often be noted in cases of congenital deformity. Many parents unconsciously regard a deformity of this kind as a reflection on themselves; their sense of guilt is stirred, and they may even hide away their child from sight of neighbours, doctors, and others.

School teachers also show emotional reactions to an infirm child. In fact no teacher is without a response of some kind, usually of sympathy or antipathy. An exaggerated sympathy is probably more characteristic of the woman teacher, and an unreasonable dislike of the man teacher. An infirm child, therefore, will hardly encounter in its classroom an ordinary emotional atmosphere. Add to this that schoolmates, boys especially, are notoriously intolerant of physical infirmity, which they are apt to treat with contempt and jeers.

Neither at home, then, nor at school, is an infirm child likely to experience the normal emotional environment which is needed for normal psychological development.

THREE CASES OF TUBERCULOSIS OF THE CENTRAL NERVOUS SYSTEM IN CHILDREN

APPARENT CLINICAL RECOVERY

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IN the course of an investigation of cases of tuberculous meningitis and glandular tuberculosis, which is being carried out on material available in the Royal Edinburgh Hospital for Sick Children and other Edinburgh hospitals, three cases have been observed which indicate that active tuberculous infection of the central nervous system, associated with the presence of tubercle bacilli in the cerebro-spinal fluid, does not necessarily proceed immediately to progressive and fatal tuberculous meningitis. Tubercle bacilli were isolated from cerebro-spinal fluid of these patients, while their subsequent history suggests that the lesion in the nervous system has been at least temporarily arrested.

Examinations are being made of specimens of cerebro-spinal fluid obtained not only from cases in which the clinical diagnosis of tuberculous meningitis is established, but also from patients who show only slight clinical evidence suggestive of an intracranial lesion with, in addition, a positive reaction to the tuberculin test. In the routine bacteriological examination, each specimen of cerebro-spinal fluid is injected subcutaneously into the groin of one or more guinea-pigs, and from one to three months later the animals are killed and examined for the presence of tuberculous lesions. If an animal is infected, differential media are inoculated with material obtained from the regional lymph glands draining the area injected.

In the three cases recorded in this paper, injection of cerebro-spinal fluid led to infection of the guinea-pigs by the tubercle bacillus. Culturally the following characteristics were noted: (*a*) In Cases 1 and 3 the growth was of the dysgonic type, indicating infection by the bovine type of tubercle bacillus. (*b*) In Case 2 the growth was of the eugonic type, indicating infection by the human type of tubercle bacillus.

CASE RECORDS

CASE 1.—A. B., aged 1 year and 7 months, was admitted to the Royal Hospital for Sick Children as a case of acute pleurisy. There was a history of cough, fever, and lassitude for eight days, and heavy breathing for three days. Vomiting occurred on the evening of onset of the illness but on no subsequent occasion. His only previous illness was measles at the age of 10 months. At the time of admission the child was in a weak undernourished state, uttered frequent cries, and continually rocked his head as if in pain. The fontanelle was small but tense. Pupils were equal and widely dilated. The Kernig reactions were negative, and there was no nuchal rigidity and no tâche cérébrale. Both ear-drums were red and bulging. Marked percussion note dullness with diminution of breath sounds and vocal resonance were noted at the left base, and aspiration was attempted without result.

The day after admission lumbar puncture was carried out, and water-clear cerebro-spinal fluid obtained under increased pressure. On microscopical examination of the fluid no tubercle bacilli or other organisms were found. There was no increase in cells, and biochemical analysis gave the following results: total protein, 40 mg. per 100 c.cm.; chlorides, 700 mg.; sugar, 0·060 per cent.; gold test, no precipitate.

After lumbar puncture there was some improvement in the child's condition, and the temperature, which had varied between 101·2° F. and 102·8° F. since admission, fell on the third day (March 25th) to 98° F. On March 29th the restlessness which had always been a feature became worse, and was associated with a rise in temperature. Paracentesis of the right ear-drum was performed with resultant relief and return of the temperature to normal. The patient was sent home on April 3rd. Three weeks later, on April 24th, he was readmitted on account of marked respiratory distress. The physical signs in the chest were similar to those found on March 23rd, except that there were in addition fine crepitations at both bases. The knee-jerks were diminished, the abdominal reflexes absent, and there was resistance to flexion of the neck. The child was very restless and continually holding his head in his hands. The tuberculin skin test was positive. At the time of readmission the temperature was 103° F., and it continued to swing between 98° F. and 103° F. for five days. Paracentesis of the left ear-drum was carried out on April 29th, blood and pus being obtained, after which the temperature settled and the child's condition greatly improved. The boy was kept in hospital a further week and discharged in good health on May 8th, 1933.

The child was visited in his home on Jan. 17th, 1934, eight months after discharge. He showed signs of bony rickets associated with a moderate pallor and laxity of the ligaments. The abdomen was prominent, but this appeared to be part of the rickets. Since his discharge from hospital the previous May the child had had several colds but otherwise progress had been uneventful.

CASE 2.—C. D., a boy aged 2 years 3 months, was admitted to hospital on April 17th, 1933. His only previous illness had been measles in April of the previous year. There was no history of disease in the family, and the housing conditions were good. Five days before admission the boy vomited but appeared to have completely recovered within an hour. Two days later vomiting again occurred and was accompanied by fever and loss of appetite, and the child kept his head held in his hands, as though in pain. Next day (April 15th) he was unable to stand on account of "weakness in the legs." On the 16th he lost the power of his right arm but regained this by the evening. He was extremely irritable during

examination following admission to hospital. He appeared to suffer discomfort on palpation of the neck and kept his head inclined to the right side. There was slight resistance to flexion of the neck. A flaccid paresis of the right leg was present associated with loss of tendon reflexes. The knee- and ankle-jerks were diminished on the left side. Plantar responses were both flexor, and the Kernig tests gave negative results. There was no weakness of either arm.

On April 19th flaccid paresis of the right leg and slight neck rigidity were still present and lumbar puncture was carried out; 50 c.cm. of clear cerebro-spinal fluid were withdrawn under pressure. A small coagulum formed in the fluid on standing. A cell count gave 130 per c.mm., and lymphocytes were in excess of polymorphonuclear cells. No organisms were found on microscopic examination. Biochemical analysis of the fluid gave: total protein, 80 mg. per 100 c.cm.; chlorides, 643 mg.; sugar, 0·132 per cent.; gold test, no precipitate.

On April 21st the temperature was 97·4° F., and remained at this level for three weeks after varying between 97° F. and 99·4° F. during the first four days in hospital. By the 24th neck rigidity had disappeared but the boy still remained abnormally irritable for two weeks after admission. During the patient's fifth week in hospital the temperature showed a slight tendency to irregularity, on one occasion rising to 99° F. About this time the pulse-rate became more rapid, and there was a slight loss in weight. Pulse and temperature settled and the patient was discharged to Challenger Lodge as a case of poliomyelitis on July 6th with paresis of the right leg still present.

The boy was seen on Jan. 21st, 1934, six months after discharge. There was considerable wasting of all the muscles of the right thigh and leg, but limited voluntary flexion and extension at the ankle-, knee-, and hip-joints could be carried out. Knee- and ankle-jerks on the paralysed side were absent; on the left side they were noticeably increased. The plantar responses were both flexor and both Kernig reactions were negative. Nothing else of note was found on examination. The boy was able to move about with the aid of a splint and his general health was good.

CASE 3.—E. F., a girl aged 4 years and 6 months, was admitted to hospital on August 3rd, 1933. Ten days previously she had been involved in a motor accident receiving injuries to the legs and left hand; she was not rendered unconscious, and when treated for her injuries nothing was found to suggest the presence of intracranial damage. She appeared to be in normal health until the sixth day after the accident when she was noticed by her mother to be drowsy. The same day (July 30th) she was incontinent. The drowsiness persisted to the time of admission. Throughout the day of July 31st she complained of a severe headache which disappeared by the evening and did not return. On the night of August 2nd she complained of pains in the back and right side, became delirious, and ran a temperature of 104° F. At the time of admission the child was lethargic and the temperature was 100° F. The next day she was more drowsy and irritable during examination; 10 c.cm. of clear cerebro-spinal fluid under slight increase of pressure were obtained by lumbar puncture. The fluid showed no increase in cells, and no tubercle bacilli or other organisms were found in it microscopically. Biochemical tests of the fluid gave the following results: total protein, 50 mg. per 100 c.cm.; chlorides, 720 mg.; sugar, 0·07 per cent.; gold test, no precipitate.

The day after lumbar puncture the child's condition began to improve; the improvement was maintained and she was discharged from hospital on August 12th after examination had eliminated the possibility of a cranial lesion. Next day she had a severe fit at home which lasted fifteen minutes and was associated with twitching of the right side of the face, right arm, and leg. She was troubled with retching after the fit and remained drowsy for the rest of the evening. She was readmitted to hospital the following day (August 14th) and the same evening had a severe fit, this being followed by vomiting and prolonged drowsiness. Two days later the girl was allowed up, and up to the time of discharge on August 24th was extremely active. Beyond a slight rise in temperature following the fit she was afebrile during the time in hospital after readmission. The tuberculin skin test was positive. The exact nature of the condition was not determined but a tentative diagnosis of epilepsy was made.

On Jan. 17th the girl was seen in her home, five months after discharge. Since leaving hospital she had continued to make uninterrupted progress and when seen was in excellent health. Her previous health is of interest. Between the ages of two and three years she had whooping-cough, chicken-pox, and German measles. At the age of three and a half years she had three severe fits all involving the right side which were never satisfactorily explained and which did not recur. The girl comes of a family known to be tuberculous. She is the second youngest of ten children, two of whom died at the age of six months, one following pneumonia and the other from tuberculous meningitis. Of those alive one sister suffers from abdominal tuberculosis and a brother and sister from pulmonary infection. The father also is tuberculous.

COMMENT

Recovery from tuberculous meningitis, though extremely rare, is not unknown. In a careful review Cramer and Bickel [1] collected 46 cases, including one of their own, which were confirmed either by demonstration of *Bacillus tuberculosis* in the cerebro-spinal fluid or by production of tuberculosis in guinea-pigs by injection of cerebro-spinal fluid, the latter test being positive in 20 cases. In many of these recovery was temporary, and death followed within a few months from recurrence of meningitis or from the effects of tuberculosis elsewhere. In some, permanent sequelæ remained. Martin [2] collected 20 undoubted cases reported since 1894.

All these seem to have presented fairly definite clinical evidence of tuberculous meningitis, though Cramer and Bickel mention three cases in which the symptoms were abortive; and Martin suggests that recoveries are possibly more frequent than has been believed, and that very mild cases which result in recovery may pass unrecognised.

Those in our series are remarkable for: the absence of the classical evidences of meningitis; the extreme mildness and transience of such nervous symptoms and signs as existed; the absence in two of the three of any definite chemical or cytological change in the cerebro-spinal fluid; and the absence in the same two of any sequelæ up to the present time. None of the three was, in fact, at the time of the attack, thought to be suffering from meningitis at all. They seem, therefore, to fall into a somewhat different category from previously reported cases of recovery from tuberculous meningitis. We believe that the proved occurrence of such cases as these may throw new light on the problem of the pathogenesis of tuberculous meningitis.

In an important paper on this subject Rich and McCordock [3] published evidence from which they concluded that the prevalent teaching—that tuberculous meningitis is part of a general miliary (blood-spread) infection—is incorrect. They claimed that careful examination of the brain will show in practically every case that the meninges have been infected from an older focus in the vicinity, most often in the brain substance, from which tubercle bacilli have escaped in large numbers into the subarachnoid space. They contend further that the diffuse exudative reaction characteristic of meningitis can occur only if there be introduced into the subarachnoid space a number of bacilli in excess of what is likely as a result of even the most severe miliary tuberculosis. They support these contentions by evidence from experiment and from human cases after death.

If this view be correct it follows that a patient who

develops tuberculous meningitis has, at some previous time, suffered an infection of his central nervous system by tubercle bacilli, which have set up a localised lesion—probably a caseous nodule (tuberculoma) superficially placed in the brain substance, or a circumscribed caseous focus in the meninges (meningeal plaque). It seems probable that the occurrence of this initial infection might in some instances be marked by clinical evidence, probably slight and transient, of a pathological process within the central nervous system. It is in the hope of obtaining some further light on this problem that we are including in our investigation specimens of cerebro-spinal fluid from children, such as these three, in whom the tuberculin test is positive and who present clinical evidence of meningeal irritation or other nervous lesions, but in whom tuberculous meningitis in the clinical sense is not present and does not develop during the child's stay in hospital.

We are as yet unable to offer proof that this suggested explanation of the facts here recorded is correct and that these incidents in the patients' histories coincided with the setting up of circumscribed lesions in brain or meninges, which may eventually cause meningitis. The subsequent history of these children will be of much interest.

One conclusion, however, seems clear. In the light of the facts recorded it is necessary to recognise that any clinical evidence of meningeal irritation or cerebral lesion, no matter how slight and transient, in a patient in whom the tuberculin reaction is positive, may be an indication of tuberculous infection of the central nervous system, even in the absence of clinically active tuberculosis elsewhere in the body, and of any definite cytological or chemical abnormality in the cerebro-spinal fluid. And the recognition of such an incident in a patient's history as a danger signal may be a step in the direction of prevention of the deadliest of all forms of tuberculosis.

We wish to express our thanks to Prof. Charles McNeil, Dr. Lewis Thatcher, and Dr. Douglas Nicholson for permission to publish the cases, and for the use of clinical records of patients under their care; also to Lieut.-Colonel W. F. Harvey and Dr. W. O. Kermack, of the laboratory of the Royal College of Physicians of Edinburgh, for cytological and chemical examinations of cerebro-spinal fluids. In the case of one of us (H. J. R. K.) the work reported in this paper was carried out during the tenure of the Kirk Duncanson fellowship for medical research.

REFERENCES

1. Cramer, A., and Bickel, G.: Ann. de Méd., 1922, xii., 226.
2. Martin, A. E.: Brain, 1909, xxxii., 209.
3. Rich, A. R., and McCordock, H. A.: Bull. Johns Hopkins Hosp., 1933, lii., 5; see THE LANCET, 1933, i., 651, and 1933, ii., 192.

CYCLOPROPANE ANÆSTHESIA IN OBSTETRICS

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BY the work of Henderson and Lucas [1] done on lower animals at the University of Toronto, by their discovery that cyclopropane possesses anæsthetic properties, by their studies of its percentages anæsthetic concentrations, by their findings concerning its effects on the circulation and respiration, and by their investigation of its influence on metabolism, they were justified in suggesting that it may be developed as a safe anæsthetic for man.

From this suggestion and from such assurances Waters [2] and his collaborators of the University of Wisconsin have gone on to use cyclopropane as an anæsthetic in surgery. They have found that in much lower concentrations it is equal in efficiency to other gaseous anæsthetics, that an excess of oxygen may be administered with this potent anæsthetic, that surgical anæsthesia can be produced in three to five minutes, that laryngeal reflexes are abolished more quickly than with ether, that it causes relaxation comparable with that of ether, that the blood pressure and pulse and respiratory rates are not altered to any appreciable extent, that recovery takes place in less than five minutes, and that the after-effects are very slight. With so much to go on, it seemed safe to use cyclopropane in obstetrics (just as divinyl oxide (vinesthene) [3] has been satisfactorily employed in this clinic during the past year).

In the series of cases herein reported, cyclopropane* was administered through a simple machine devised especially for the use of vinyl oxide in obstetrics and made by the Foregger Company of New York. The principal feature of this machine is a closed system containing alkali for the removal of carbon dioxide from the expired air so that the same anæsthetic may be breathed over and over again, thus making it very economical to use this rather expensive gas. Intermittent analgesia was produced as indicated for the more severe labour pains, and anæsthesia was maintained for the delivery procedures.

The facts of the first administrations of cyclopropane to parturient women are set out in the accompanying Table. This list shows considerable variety in the conditions of the patients as well as in the procedures of delivery. Satisfactory analgesia was easily produced when very small quantities of cyclopropane were inhaled with oxygen. Although none of the times of analgesia was long, I think it would be quite safe to relieve the pains with cyclopropane much earlier in labour than has been done, for the reasons that the uterine contractions have not been inhibited and that so much oxygen was used. We all know that it is good to administer oxygen intermittently—good for the mother and good for the fœtus, especially should the heart of the latter be weak. The use of oxygen in obstetrics is very important. During anæsthesia any required degree of muscular relaxation could be obtained without evident harm, and recovery was devoid of untoward effect to mother or child.

The bromsulphalein dye test [4] for liver function was carried out in three normal cases and in one of eclampsia. Practically no dye was retained in the blood of the normal women when the test was applied about twenty-four hours after the administration of cyclopropane, and as the liver of the eclamptic woman was damaged to an extent of more than 55 per cent. before delivery the damage was not enhanced by cyclopropane, there being less than 50 per cent. dye retention in her blood twenty-two hours after anæsthesia. Corroboration of the effects of cyclopropane on hepatic function has been obtained from experiments on dogs in the department of pharmacology of McGill University. It was found that cyclopropane administered over relatively long periods of time causes practically no impairment of liver function in normal dogs and no additional damage to those previously poisoned with chloroform.[5] It may be pointed out that this feature is equally favourable for cyclopropane and for vinyl oxide [3] when compared with chloroform.[6] It is apposite to mention that any measure of the action of a drug on the liver may be taken as good evidence of what is going on concurrently in other organs, indeed in the rest of the body.

From this inchoative study I may say that cyclopropane seems to be very suitable for the relief of

* The cyclopropane was obtained through the generosity of Prof. H. E. Reilley, of the Department of Physics, McGill University.

pain in obstetrics, for the following reasons: (1) An abundance of oxygen is given with the cyclopropane. (2) Circulation and respiration are not depressed. (3) Anæsthesia is produced without appreciable metabolic disturbance. (4) Liver function is not impaired. (5) Anæsthesia is quickly and agreeably induced, satisfactorily maintained at any desired depth with ready flexibility and with minimal danger to the mother and child, and recovered from easily and uneventfully.

Cyclopropane Anæsthesia in Obstetrics

No.	Age.	Pregnancy No. and condition.	Time in minutes. Analg.	Anæs.	Total.	Delivery procedure.
1	33	IX. Normal.	..	20	20	Rupture of membranes.
2	19	I. „	28	32	60	Sp. ep.*
3	19	I. „	25	40	65	„
4	26	II. „	20	12	32	„
5	23	I. „	40	47	87	Low-forceps, ep.
6	25	I. „	15	20	35	Sp. ep.
7	26	I. Flat pelvis.	..	46	46	Low Cæsarean section.
8	25	I. Toxic; B.P. 150/100; albuminuria + +.	35	27	62	Mid-forceps, ep.
9	22	I. Old poliomyelitis. Face to pubis.	..	60	60	Ditto, repair of complete tear.
10	26	I. Flat pelvis.	..	62	62	Low Cæsarean section.†
11	44	I. Uterine fibroids.	..	59	59	Classical Cæsarean section, sterilisation.*
12	17	I. Toxic; B.P. 140/100; albuminuria +.	25	35	60	Sp. ep.
13	28	I. Coccygeal deformity.	..	48	48	Low Cæsarean section.
14	18	I. Eclampsia; two seizures; four days in hosp. Bag induction. B.P. 160/118: albuminuria + +.	..	41	41	Sp. delivery of deadborn. (Uneventful recovery.)
15	35	III. Normal.	20	25	45	Sp. ep.
16	27	I. „	48	19	67	Mid-forceps, ep.
17	25	II. „	..	31	31	Sp. ep.
18	26	I. Breech presentation.	23	21	44	Extraction, ep.
19	25	I. „	..	37	37	„
20	24	I. Generally contracted pelvis.	..	51	51	Low Cæsarean section.†
21	23	I. Normal.	4	31	35	Sp. ep.
22	33	II. „	..	17	17	Spontaneous.
23	25	III. „	..	20	20	Sp. ep.
24	40	II. „	5	19	24	„
25	20	II. Brow presentation.	40	21	61	Mid-forceps, Scanzoni with ep.
26	21	I. Normal.	8	22	30	Sp. ep.
27	22	I. „	5	21	26	„
28	20	I. Retained placenta.	..	18	18	Removal and packing.*
29	23	I. Normal.	47	25	72	Sp. ep.
30	28	I. „	34	23	57	Sp. repair of small tear.
31	22	I. „	..	22	22	Sp. ep.
32	25	I. „	36	20	56	„
33	21	I. „	..	32	32	„
34	19	I. „	4	19	23	Sp. repair of small tear.

* Vomited once. † Vaginal preparation under anæsthetic. Sp. ep. = Spontaneous episiotomy.

Cyclopropane was the only anæsthetic used in every case. All section cases had atropine gr. 1/150 half an hour before operation. There was no other pre-anæsthetic medication in any instance.

I desire to thank Dr. D. W. Sparling, assistant resident of the hospital, for his valuable aid.

REFERENCES

1. Henderson, V. E., and Lucas, G. H. W.: Anæsth. and Analg., 1930, ix., 1.
2. Stiles, J. A., Neff, W. B., Rovenstine, E. A., and Waters, R. M.: Ibid., 1934, xiii., 56.
3. Bourne, W.: THE LANCET, 1934, i., 566.
4. Rosenthal, S. M., and White, E. C.: Jour. Amer. Med. Assoc., 1925, lxxxiv., 1112.
5. Raginsky, B. B., and Bourne: In press.
6. Rosenthal and Bourne: Jour. Amer. Med. Assoc., 1928, xc., 377.

Clinical and Laboratory Notes

A CASE OF PARATYPHOID A FEVER IN BRISTOL

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WITH the possible exception of a few cases in travellers returning from abroad paratyphoid A fever can hardly be said to have existed in England since the war. It may therefore be of interest to record the case of an adolescent who contracted it at home without having travelled or associated with travellers. Moreover there is some instruction to be drawn from the serological data on which the diagnosis was based.

Previous History.—A youth, 16 years of age, lived in an orphanage at Bristol, until two years ago, when he went to live with his brother in London. On Dec. 12th, 1933, he was admitted to the Central Middlesex County Hospital suffering from tinea cruris and follicular tonsillitis which both cleared up under suitable treatment. On Jan. 27th, 1934, in accord with regulations, he was sent to a hospital in the area of his previous location, viz., Southmead, Bristol, and came under the care of Dr. P. Phillips. There were no cases of typhoid or paratyphoid fever in the hospital during the patient's stay there, and as far as is known the patient was never in contact with anyone who had been abroad. He had a long history of constipation and megacolon, but apparently had never previously had enteric fever and had never received T.A.B. vaccine.

Clinical History.—The illness began on Feb. 27th and the patient was later transferred to Ham Green Fever Hospital under Dr. B. A. Peters. The clinical features were typical of enteric fever (typhoid or paratyphoid). The onset was insidious with general malaise, dizziness, drowiness, anorexia, and constipation. The temperature rose by "steps" to 104° F., the pulse was slow, the spleen was palpable (three finger-breadths below the costal margin), and scanty rose spots were observed on the abdomen. One unusual feature was observed, namely, that the spleen remained palpable until March 28th—ten days after the temperature had fallen to normal (March 18th). By the 26th the patient was fit to be out of bed, and recovery was uneventful.

AGGLUTINATION TESTS

Dates (onset Feb. 27th)	H Suspensions. T	H Suspensions. A (R.F. 5)	H Suspensions. B	O Suspensions. T (R.F. 9)	O Suspensions. A (R.F. 2)	O Suspensions. B (Aertrycke) (R.F. 6)
March 10th	O (at 25)	2500	O (at 25)	120	25	150
„ 23rd	O (at 25)	700	O (at 25)	150	25	300
May 4th	O (at 25)	10	O (at 25)	10	O (at 5)	30
„ 22nd	—	O (at 5)	—	O (at 5)	—	—

The figures represent the last dilution at which strong partial agglutination was found.

As the accompanying Table shows, the tests with (Oxford) H-suspensions of *Bact. typhosum* (T) and *Bact. paratyphosum* B (B) showed no flocculation throughout (though traces of granular clumping could be detected in the typhoid suspension up to 1 in 50 in the first test), whereas *Bact. paratyphosum* A (A) showed an initially high titre which gradually fell to nothing during the following eight weeks. The O reactions will be discussed below.

Bacteriological Examination.—Repeated tests of stools and urine failed to reveal any organisms of the typhoid-

paratyphoid group. No blood culture was done, an omission which is explained rather than excused by its being habitual in this country. We should like to register a plea for the routine practice of this procedure in all cases of suspected enteric fever.

The fluctuation of the paratyphoid A H-agglutinin during the course of the illness is exactly what one would expect in an acute enteric fever, when the first test is done in the middle of the second week—i.e., somewhere near the peak of the curve—and the second a fortnight later, when a rapid fall would be in progress. Neither previous infection nor inoculation could give rise to this phenomenon; nor is there any evidence that the patient had ever undergone either.

According to the accepted canons of serology, the production of paratyphoid A flagellar (H) agglutinins in high concentration and a typically falling graph during convalescence can only be due to infection with *Bact. paratyphosum* A. With regard to the somatic (O) agglutinins, the low level of the paratyphoid A, and the more considerable height of the others are surprising, but we do not know enough about the serology of this infection to judge how abnormal this may be. We know that there is a somatic antigen common to the three organisms, in addition to the specific somatic component of each; and it may be that this—the former—is the more active in paratyphoid A fever.

The figures given in the Table for the O agglutinins on March 10th are probably too low, since the serum had been stored for more than a fortnight before testing, and we know that O agglutinins are less stable than H. The apparently delayed peak of the O curves is therefore probably unreal.

Our thanks are due to the physicians in charge of the case for their kind permission to publish it.

SUPPURATIVE OVARITIS FOLLOWING MUMPS

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We have found no record of ovaritis as a complication of mumps published since 1929, and no British record since 1925. The only report of ovaritis occurring in a mumps epidemic is that of Troitsky,[1] who found non-suppurative ovaritis in 13 out of 33 girls afflicted. The condition was regarded as, pathologically, a peri-oöphoritis. Recovery was the rule and no permanent change in menstrual function is described.

The literature was reviewed by Harlow Brooks in 1913[2] and in quoting the few cases on record he stated that none had been published between 1903 and 1913. He also called in question the diagnosis in a case reported by Meinhardt.[3] This is the only one of suppurative ovaritis following mumps that we can find in the literature, and Brooks's comment is as follows: "Inasmuch as this is the only instance reported in the literature in which metastatic pus formation took place in the ovary, although several instances in which suppuration has taken place in the male sexual gland are recorded, Meinhardt's case cannot be definitely accepted and the possibility of a concurrent appendicitis or salpingitis is suggested." It is therefore important to place on record the following case of suppurative ovaritis following mumps with operation later and recovery.

Mrs. A., aged 43, became ill on Feb. 7th, 1933, with sore-throat and difficulty in swallowing. Her two sons were at this time lying in the same room suffering from typical mumps. Her throat and tonsils were acutely inflamed. A whitish exudate covering the tonsils in parts was easily removed without causing bleeding. Temp., 99·6° F.; pulse-rate, 104. A swab from the tonsils proved negative to *B. diphtheriæ*. On Feb. 8th her morning temperature had risen to 100·2° and the pulse-rate to 106. Both parotid glands were now enlarged and markedly tender, but the submaxillary glands appeared normal. There was definite improvement in the condition of the tonsils. She now complained of headache and nausea, but did not vomit. In the evening the temperature was 103·6° and the pulse-rate 128. On Feb. 9th the morning temperature was 104·8° and the pulse-rate 142. While there was no change in the condition of the parotid glands, the pharynx and tonsils appeared normal. She now complained of severe pain in the epigastrium, and was vomiting frequently. Her tongue was dry and furred. The abdomen moved freely on respiration, without increasing the severity of the pain but there was definite tenderness in the epigastrium. There was no change in the pulse-rate and temperature at noon, but the pain was now referred to both iliac fossæ. The vomiting was replaced by almost continuous retching. The abdomen still moved freely on respiration, but there was marked tenderness low down in both iliac fossæ. There was no rigidity of the abdominal wall, nor was any mass palpable. Rectal examination was indefinite. The patient's condition was unchanged in the evening, save that the parotid swellings were somewhat diminished. (J. B. McK.)

On Feb. 10th the morning temperature was 104·6° and the pulse-rate 144. The abdominal pain was much worse, and retching almost continuous. She had now diarrhœa (one motion per hour), and the stools contained a fair amount of mucus. The tongue was dry and furred and the odour of the breath fœtid. There was no apparent swelling of the parotid glands, but some tenderness yet remained. The abdominal findings were as before, but on rectal examination there was marked tenderness on both sides of the pelvis. Ovaritis was diagnosed. (H. H. S.)

On Feb. 11th the temperature was 99·6° and the pulse-rate 124. Abdominal findings remained unchanged; the retching had yielded to the administration of atropine. In the evening the temperature was 103·6° and the pulse-rate 136. On vaginal examination there was a fair amount of bleeding from the uterus. There was exquisite tenderness in all fornices and the uterus appeared to be retroverted and of normal size with some diminution in mobility. The last menstrual period had finished on Feb. 3rd.

On Feb. 12th the morning temperature was 99·6° and the pulse-rate 92. A mass was palpable in the left iliac fossa. The evening temperature did not change, while the pulse-rate rose to 100. From Feb. 13th–15th the temperature remained normal and the pulse-rate ranged from 76 to 86. While the patient had no symptoms, the mass in the left iliac fossa remained unchanged. Feb. 16th: morning, temp. 99°, pulse-rate 78; evening, temp. 99·8°, pulse-rate 80. Feb. 17th: morning, temp. 99·6°, pulse-rate 80; evening, temp. 104·4°, pulse-rate 96. The temperature then fell to normal and remained so till Feb. 24th, when it suddenly rose to 101·8°. There had been no change in her condition in the intervening period. Coincident with this rise of temperature on the 24th the patient complained of severe pain in the left iliac fossa and began to vomit. The mass was now remarkably tender and nothing could be made out on vaginal examination except that it appeared to be distinct from the uterus, and very tender. It reached almost half-way to the umbilicus.

Under chloroform and ether anæsthesia the abdomen was opened by a midline subumbilical incision by H. I. McC. Pus welled into the wound. The pelvic cavity was closed off by adhesions and omentum. The appendix was lying behind the terminal ileum and was normal. On

[1] Vratch, 1902, No. 15.
[2] Jour. Amer. Med. Assoc., 1913, lx., 359.
[3] Beobachtung en über Parotitis. Med. Zeitung. Russlands, 1853, x., 265.

further examination of the pelvis a considerable quantity of odourless pus was cleared away. Both Fallopian tubes were of normal size and appearance, save for a few adhesions to the bowel. The left ovary was almost entirely necrotic and for the most part had disappeared. What remained was intensely engorged, soft, and on pressure collapsed between the fingers exuding pus. The right ovary was also the seat of a necrotic process but not to such a marked degree as the left. It was a little enlarged and on section was the seat of multiple abscesses, varying in size from a pinhead to that of a pea. The general abscess cavity was cleared out, and the necrotic ovarian tissue removed; it was possible to conserve about one-sixth of the right ovary. The pelvic cavity was drained through the abdominal wound. The retroverted position of the uterus was considered to be a barrier to drainage of the pouch of Douglas through the posterior fornix. Convalescence from the next day onwards was uneventful, and the patient left hospital three weeks later with the abdominal wound completely healed. Nothing was felt on vaginal examination except some thickening in both lateral fornices and complete immobility of the uterus. (H. I. McC.)

This patient has remained well since her illness, and menstruation has retained its normal characters.

Belfast.

MEDICAL SOCIETIES

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE summer meeting of this association was held at the Royal Infirmary, Gloucester, on June 23rd. Dr. E. N. DAVEY, pathologist to the hospital, occupied the chair. The proceedings were largely devoted to a consideration of the

Clinical Pathology of Coma

Dr. G. ROCHE LYNCH (London) spoke of the

TOXICOLOGY OF THE BARBITURATE GROUP OF DRUGS

He pointed out that all drugs of this group have the common basis of a combination of malonic acid with urea, the different proprietary preparations being produced by the substitution of various radicles at varying points; some of these preparations in addition to the malonyl-ureide compound also contained various proportions of amidopyrin or pyramidon. A single pharmacological dose produced sleep; repeated doses might in sensitive persons give rise to such symptoms as drowsiness, ataxic gait, ptosis, diplopia, and visual hallucinations. The barbiturates were not cumulative in the ordinary sense of the word, but after prolonged exhibition the effects might be slow in disappearing; the margin between the effective and the toxic dose was small; after a toxic dose symptoms might appear in a few minutes; these were headache, ataxia, vertigo, and drowsiness passing on in to coma; there might be a preliminary period of excitement. On the establishment of coma the plantar reflex might become Babinski in type and the breathing periodic, the pupils were small but not pin point, and the temperature became subnormal; broncho-pneumonia tended to appear after the first 24 hours of coma. The speaker pointed out that many persons showed an idiosyncrasy to the barbiturates and uttered a warning for their use with caution in toxic conditions of the liver, hyperthyroidism, chronic sepsis, renal disorders, and in all states of allergy.

There was considerable variation between the minimum and the average fatal dose. Post-mortem findings were not characteristic; broncho-pneumonia was almost constant but this was of no special type; the liver and kidneys showed fatty and parenchymatous change, but this might be only evident on microscopic examination. It had been pointed out to the speaker by Dr. W. D. Newcomb that the cerebellum frequently showed a pressure cone. Pemphigoid and bullous rashes might appear on the skin.

He questioned whether in all cases returned as suicide from barbiturate poisoning the drug had actually been taken with fatal intent. He recorded one instance in which ten tablets of a barbiturate preparation were taken during one night; on recovering consciousness the patient recollected having taken two only; the remaining eight had apparently been taken in a state of somnambulism induced by the drug. He recommended that in cases where patients are given more than sufficient tablets for one night they be instructed to take the night's dose and then to place the remainder in an inaccessible spot.

In the treatment of barbiturate poisoning Dr. Roche Lynch advocated washing out the stomach; for this purpose alkali should on no account be used as this rendered the poison more soluble; strong coffee and glucose should be left in the stomach and the washout repeated two or three times at intervals of four hours or so. Colonic lavage was useful and should be repeated after 12 hours. Cardiac stimulants should be exhibited in full doses. Lumbar or cisternal puncture was of the utmost importance and should be repeated every 12 to 15 hours so long as the case seemed to demand it. This procedure served both to remove the poison which was excreted in high percentage into the cerebro-spinal fluid and also to relieve cerebral pressure. Other methods of treatment were by strychnine, picrotoxine, and alcohol. Great claims had been made for treatment with strychnine and massive doses had been given. Dr. Roche Lynch, although regarding strychnine as valuable, urged reasonable caution in its use.

In identifying a case of barbiturate poisoning the urine, stomach contents, and cerebro-spinal fluid should be examined for the poison; examination of the cerebro-spinal fluid was of particular importance as drainage should be persisted with until the drug had practically disappeared. The speaker described the methods of identification of the drug in the various body fluids and pointed out that the barbiturates fell into two groups, one of which was rapidly broken down while the other was more stable. Dial belonged to the former group and the amount of this excreted in the urine might be very small.

Dr. J. G. GREENFIELD (London) reported finding excess of protein in the cerebro-spinal fluid; in view of the evidence that cerebral œdema with increase of cerebral pressure played some part in the production of symptoms he queried the safety of cisternal puncture.

Dr. GREENFIELD reported several cases of

SUBDURAL HÆMATOMA

He stated that this condition appears to be becoming more frequent, probably on account of the increase in motor accidents. Its occurrence was much commoner in males than in females. He pointed out that the cerebro-spinal fluid might be absolutely normal and not even under pressure; sometimes it showed slight discoloration of the supernatant fluid after centrifugalisation and an increase of protein, but

these features were not constant. Flakes of fibrin might be present in the fluid as withdrawn; their presence constituted an important diagnostic aid. Dr. Greenfield thought it was difficult to account for the long latent period between injury and the onset of pressure symptoms on the assumption of actual continuance of the hæmorrhage. The increased cerebral pressure might be brought about by imbibition of fluid into the hæmatoma, this being occasioned by increase in the osmotic tension of the hæmatoma contents due to breakdown of the blood.

Dr. A. G. SHERA (Eastbourne) described several cases of

COMA DUE TO SUBARACHNOID HÆMORRHAGE

He drew attention to the existence of a spinal as well as a cerebral form; the former never produced coma and was only mentioned for the sake of completeness; in the spinal form the main symptom was severe pain in the back relieved by lumbar puncture. In both the spinal and the cerebral forms the cerebro-spinal fluid was almost invariably blood-stained, the blood was intimately and uniformly mixed with the fluid, and on centrifugalisation the supernatant fluid was coloured to a degree depending on the distance of the date of the hæmorrhage. Besides giving relief to the headache, lumbar puncture was an important diagnostic measure; the condition was usually accompanied by some degree of fever and, short of examination of the cerebro-spinal fluid, the diagnosis between it and meningitis might be impossible. Massive albuminuria might occur and papillœdema and retinal hæmorrhages were common.

Dr. GREENFIELD showed microphotographs demonstrating deficiency of the media of the cerebral vessels to be common at points of bifurcation; it was at these deficient sites that the aneurysms whose rupture gave rise to subarachnoid bleeding were formed.

Dr. F. B. SMITH (Preston) spoke of

DIABETIC COMA

He stressed the importance of the examination of the urine for sugar and acetone in this condition, but attached little importance to the estimation of the blood-sugar. He pointed out that in certain cases uræmia and diabetic coma might occur together; it was important therefore to know the blood-urea level. In treatment he considered that the administration of glucose as a means of combating ketosis should play a prime part; the level of the blood-sugar induced by this glucose feeding he considered to be more or less immaterial and frequent examinations of the blood-sugar were not necessary in the treatment of diabetic coma.

Dr. S. C. DYKE (Wolverhampton) stated that some degree of urea retention was common in diabetic coma and might reach a high degree; he cited one case in which it had reached 350 mg. per cent.; the patient recovered. He considered that it was important in the treatment of diabetic coma to bring the blood-sugar level down to reasonable limits, otherwise the tendency to tissue water depletion was not combated. He advocated the administration of saline rectally, intraperitoneally, and subcutaneously in preference to intravenously.

Dr. L. JANES (Brighton) pointed out that the unlimited introduction of saline into the system might serve to upset the mineral balance of the organism; he suggested that Ringer's solution was a preferable form in which to administer fluid.

Dr. A. RENSHAW (Manchester) asked why, since there was plenty of available sugar in the blood in diabetic coma, it was necessary to give sugar by the mouth.

HYPERTENSIVE ENCEPHALOPATHY

Dr. S. C. DYKE reported seven cases illustrating the occurrence of coma, and in some cases convulsions and other grave cerebral manifestations in association with raised blood pressure. He used the term "hypertensive encephalopathy," first employed by Oppenheimer and Fishberg, to describe the condition. Five of the patients referred to were children or young adults; in addition to coma all these showed convulsions and some of them amaurosis; two patients were elderly, convulsions were absent in these cases. All the younger patients were suffering from acute glomerulonephritis; evidence of renal damage was absent in the elderly subjects. The common feature to all was a raised blood pressure. The speaker pointed out that when occurring along with evidence of renal damage this condition is usually described as "uræmia"; in none of the cases observed, however, was the blood-urea significantly raised, and the term was not therefore applicable. Treatment was by venesection, lumbar puncture, and magnesium sulphate rectally and by mouth, and all cases made a good recovery.

Dr. CUTHBERT DUKES (London) considered that all the cases described were of nephritis and that the manifestations might properly be called "uræmia."

Dr. A. F. S. SLADDEN (Swansea) considered that in the light of present knowledge some examination into the meaning of the term "uræmia" was advisable.

Dr. P. C. HOU (Cheeloo) described a case of

Monocytic Leukæmia

The patient in the course of a short illness during which non-hæmolytic streptococci were isolated from the blood stream showed a white cell count of over 200,000 per c.mm., the increase in the cell count being due to mononuclear cells. By supravital staining these cells gave the appearance of being monocytes. After death nearly all organs showed infiltration with cells of this type. On warm stage preparations of the blood the cells were non-motile.

Dr. E. N. DAVEY (Gloucester) demonstrated specimens from a case of Addison's Disease unsuccessfully treated with Eucortone. At post-mortem examination extensive tuberculous disease of both adrenals was found. An exacerbation of an old tuberculous lesion of the lung waked into activity in the course of the treatment.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

THIS society met at Newcastle-on-Tyne on June 8th, when Mr. FRANK STABLER read a communication on

Blood Reinfusion in Hæmoperitoneum associated with Ruptured Ectopic Gestation

He had performed auto-transfusion in 14 cases of hæmoperitoneum during the last three years; in 13 cases the bleeding was due to acute rupture of a tubal pregnancy, and in 1 it was from a ruptured vein on the surface of a pedunculated subperitoneal fibroid. His technique was as follows:—

Immediately after arresting hæmorrhage he baled the fluid blood out of the abdomen with a coffee cup into a pint glass measure, containing one ounce of 2 per cent. sodium citrate solution, and covered with six to eight thicknesses of muslin gauze soaked in citrate. The whole was kept in a basin of water at 100° F., and one ounce of citrate solution was added as the blood was baled in. If there was any difficulty in securing enough blood, the table was lowered from the Trendelenburg position. The reinfusion was done immediately after the abdomen was

closed. He used the most suitable vein at the bend of the elbow, making a diagonal incision, and tying in a cannula, and ran in the blood at a rate not faster than one pint in one hour.

Mr. Stabler quoted several typical cases: one had a blood pressure of 54/38 on admission, ten hours after rupture, the temperature being 96° F. and the pulse 132, impalpable at the wrist. When the abdomen was closed the blood pressure was 65/40. During transfusion it went up gradually and at the end of transfusion it was 115/63 with a pulse-rate of 132. It was common for blood pressure to rise 20 to 30 mm., red cell count to rise by 1½ to 2 millions, and hæmoglobin to rise 20 points. Control cases showed that blood pressure did not rise as a result of anæsthesia, the Trendelenburg position, or hæmostasis alone; in fact, where transfusion was not done there was a fall in blood-pressure for two hours of about 10 points, so that transfusion actually produced a gain of 30 to 40 mm. blood pressure. Regarding the possibility of introducing infection with the blood, Mr. Stabler thought that the blood stream was the safest place to put organisms other than hæmolytic streptococci, and if those organisms were present in the abdominal blood the end-result would probably be the same whether they were injected into the blood stream or not. However, blood in the peritoneal cavity often became infected after about 48 hours, and therefore reinfusion was always avoided if the acute rupture had occurred more than 24 hours before operation or if there was fever. Multiple pulmonary embolism from rouleaux of corpuscles or small clots were possible; in this connexion Mr. Stabler regarded the rate of injection as important. One patient died 42 hours after operation, but death was not attributable to the reinfusion. Since the pathologist's report on the autopsy was: "Button-hole mitral stenosis; lungs show chronic venous congestion and three small patches of broncho-pneumonic consolidation; microscopically they do not show any evidence of embolic blocking."

Mr. HARVEY EVERS read a communication on the

Lower Segment Cæsarean Section

detailing his experience in 150 cases. The results were as follows:—

—	Mothers died.	Babies.		Morbidity.
		Stillborn.	Died.	
Whole series (150)	4	5	6	29
Cases operated on before labour (27)	0	1	0	2
Suspect or septic cases (123)	4	4	6	27
Failed forceps cases (24)	3	2	3	14
Suspect cases, excluding failed forceps (99)	1	—	—	13

The results were very satisfactory as a whole. The figures for suspect cases were extremely good considering that many of the cases would have been regarded by some obstetricians as unfit for Cæsarean section. The failed forceps group, as might be expected, gave the worst results, but in view of the serious condition of several of the patients he thought them reasonably good. 75 per cent. of the maternal and nearly 50 per cent. of the fœtal mortality occurred in this group, and the morbidity was high. It would be difficult to produce a parallel series of cases treated by the classical method with such satisfactory results.

The following were the four fatal cases:—

CASE 23.—Failed forceps; died of general peritonitis on the fifth day. It would have been better to drain this case.

CASE 58.—Emergency. Prolonged labour; membranes ruptured 12½ hours; died of broncho-pneumonia on the 31st day.

CASE 73.—Failed forceps; retained placenta, removed manually after operation; died of broncho-pneumonia on the 36th day.

CASE 84.—Failed forceps; much damage to soft parts; died of broncho-pneumonia on the 7th day.

Indications.—The great majority were cases of contracted pelvis. In some the operation was done after trial labour, and the basic factor at fault was poor uterine action rather than disproportion. It was in these cases that the lower segment approach had special advantages over the classical method; it reduced the number of inductions of labour. In 5 cases there was a placenta prævia, but in only 3 of them was it the real indication for operation; there was troublesome hæmorrhage, and Mr. Evers was not impressed with this means of access for this type of case. Fibroids were present in 4 cases, but only provided the indication for interference in 1; the fibroid was posterior, and though it obstructed labour it did not interfere with the approach to the lower segment. There were several cases of breech presentation, several elderly primiparæ, and 1 of sacro-coccygeal tumour. In 3 cases the operation followed induction of labour which had failed; 1 of them showed severe morbidity. In 1 case the cord was 100 in. long and was round the neck nine times.

Technique.—Mr. Evers agreed with Mr. Stabler that a douche followed by antiseptic treatment of the vagina and cervix was sound practice, though he had only had this carried out on rare occasions.

Anæsthesia had usually been general, never local; spinal anæsthesia was used twice. The patient was horizontal, a slight Trendelenburg position was used in the early cases, but it was not essential and encouraged flow of septic matter from the vagina into the uterus. The incision used was the ordinary low vertical subumbilical transperitoneal incision; on two occasions when the extraperitoneal route was used it was unsatisfactory. It was important that the bladder should be quite empty. The peritoneal cavity was packed off by gauze. The peritoneum of the utero-vesical pouch was incised transversely and the bladder pushed down. This was only liable to be difficult in repeat cases. In 16 of the early cases a transverse uterine incision was used; it had, however, no advantage in delivering the head, bleeding was more severe, and it was difficult to prevent tearing into the blood-vessels at the sides. A vertical incision was now used; the uterus should be pushed into the middle line first, and any torsion present undone; an accurately median vertical incision minimised hæmorrhage. It should begin as low as possible, and should be extended upwards by scissors. Extension downwards of the incision during delivery might wound the bladder, and extension or tearing up into the upper segment increased bleeding and weakened the scar. The membranes were preserved while the incision was made; then 1 c.cm. of pituitary extract was injected into the uterine muscle. Bleeding from the cut edges was controlled by catch forceps or by special forceps designed by Mr. Evers.

The head was delivered by lifting the caput and moulded part of the head up into the wound; then pressure was exerted on the fundus, the head being kept fully flexed. The previous injection of pituitary was a great help. In difficulty, one or both blades of a pair of short forceps were used. This was often necessary in cases not in labour, or when the head was floating. One blade was used in 20 cases, two blades in 10 cases, and the feet were extracted first in 8 cases of deliberate version or of breech presentation.

Delivery of placenta and membranes.—In 15 of his early cases Mr. Evers delivered the placenta per vias naturales at the end of the operation. Case 73,

in which the retained placenta had to be manually removed, induced him to discard the method. This was a failed forceps case, and the manual removal might have contributed to the fatal result. Since then he had always waited for the placenta to separate, and in many cases it was expelled into the lower segment and could be removed by roping the membranes. In a few the hand must be passed into the upper segment to remove it, but this should be avoided if possible. The uterus was closed by two layers of sutures and the peritoneum by continuous catgut. There was complete lack of tension, apposition was excellent, and healing sound. In suspect and failed forceps cases, a piece of tissue drain was split at one end; one portion drained the uterine wound, and the other the utero-vesical pouch. It should not be removed too soon.

Repeat cases.—There were 39, of which 29 had had classical and 10 lower segment operations; of the 29, 3 had had two previous operations and 1 had had three; of the 10, all had had only one previous operation. In one lower segment case the upper segment had been encroached on and the scar was thin at that point; in the others there was no sign of scar. In patients becoming pregnant again (49 cases after the lower segment operation, there has been no case of ruptured scar. Some had had normal delivery at full term, many have had induction, and many have had repeat operations.

Mr. Evers summarised the advantages of the operation as follows: (1) Trial labour can be made with much less risk. This diminishes the number of Cæsarean sections and inductions. (2) The danger of sepsis is much less and if it occurs it is likely to be pelvic and not general. (3) There is a definitely lower maternal mortality in suspect and failed forceps cases. (4) The operation, though technically more difficult, is accompanied by much less hæmorrhage. (5) The convalescence of the patient is considerably less stormy. (6) The risk of subsequent rupture of the scar appears very slight. The only disadvantage of the operation is that it is admittedly sometimes difficult to do in cases not in labour.

Dr. FARQUHAR MURRAY read a communication on

The Value of Lipiodol and X Rays

in the diagnosis and treatment of pelvic mischief. The technique adopted consists of injecting 8 c.cm. of slightly warmed lipiodol by means of the screw syringe provided by Messrs. Bengué. The patient was under anæsthesia and the vagina and cervix had been swabbed with acriflavine. The cervix was not dilated but was clamped to the cannula by a volsellum. The patient was sent to the X ray department with the volsellum still clamping the cervix, and a second photograph, which was essential for correct interpretation, was taken in 24 hours. In a normal case the shadow of the uterine cavity, attenuated threads representing the tubes, and a mass, usually well defined, near the ostia, were visible. In 24 hours the uterine and tubal shadows had disappeared and there was merely diffuse blurring. The presence of vaginal shadow and clinical observation indicated that drainage in these cases was both per abdomen and per vaginam. Normal tubes were distensible and also contractile, and this was a disadvantage when neo-hydriol, a preparation thinner than lipiodol was used, as far as the shadows were concerned. Dr. Farquhar Murray discussed the interpretation of tubal and terminal shadows, which were of great importance. With regard to sterility lipiodol provided a method of obtaining information which prevented purely speculative and often futile operations.

There were three main types of case. In the first the uterus was shown up in the photograph, but not the tubes. Operation was not advised here, as the state of the tubes was unknown and a plastic operation at the cornua produced results too speculative to be justified. In the second type, the solution distended the tubes to the abdominal ostium, which was sealed. Terminal blobs of solution were observed in 24 hours. This showed patency and normality of the tube as far as the ostium and salpingostomy was indicated. In the third type the solution passed to the abdominal ostium merely as a fine thread; in 24 hours there were only two small dots corresponding to the ends of the tubes. This, in Dr. Murray's opinion, probably means fibrosis of the tube; the result of salpingostomy in such a case was very doubtful.

Sometimes lipiodol with an X ray revealed an error in the insufflation test.

In cases of pelvic pain where examination was negative and diagnosis rests between urinary and tubal infection, Dr. Murray, with the idea of avoiding operation if possible, proceeds as follows:—

The general condition and urinary tract were treated for two months, citrates, bromides, and aperients figuring prominently in the régime. If this did not cure, injection of lipiodol and X ray examination was done. Laparotomy was advised if the solution did not enter the tubes. If it entered the tubes but did not escape into the abdomen, or if it passed into the abdomen freely with normal photographs, further symptomatic treatment was recommended.

If the shadows appeared normal, one would be reasonably certain that the tubes were at fault if the patient admitted that the injection made the pain worse, and by the indirect evidence that in some cases the pain had been ultimately relieved. If a definite lesion is proved to exist operation was not done, because the damage could not be gross or it would have been palpable. If the solution reached the ends of the tubes, though it failed to reach the abdomen, the existence of tubal drainage was proved and this justified optimism. If the pain remained after a further two months' treatment, operation was justified.

In cases of chronic cervicitis and vaginitis which required radical disinfection, it had been his rule to inject lipiodol and have the cases X rayed. Definite proof of tubal disease was sometimes found even if there was no pain. Lipiodol and X ray examination gave useful information in cases of inflamed appendages in young women not only about the diseased appendage, but also about the one which it was hoped to conserve. This may mean intelligent instead of speculative treatment at laparotomy.

Cases were described by Dr. FARQUHAR MURRAY and Mr. HARVEY EVERS.

WOOLWICH WAR MEMORIAL HOSPITAL.—This hospital, opened six years ago with 112 beds, is already so seriously inadequate that an appeal is being made for £50,000 for enlargements. There is a waiting-list of 202, and the bed accommodation is exceeded. In consequence of extensive building the population is definitely growing and the position is officially described as a "terrible problem." The allocation of the wards is unsatisfactory, and since there is only one ward for men it has become the invariable practice to admit urgent cases to the children's ward. There is a maternity ward for eight mothers, but on one occasion in the past year 15 mothers and 14 babies were being nursed. The housing of the nursing staff "causes considerable concern" and the radiological departments are proving too small for requirements. The weekly cost per patient last year was £3 9*s*. 6*d*.

REVIEWS AND NOTICES OF BOOKS

1. Nephritis and Allied Diseases

Their Pathogeny and Treatment. By ROBERT PLATT, M.D. Sheff., M.R.C.P. Lond., Physician, Royal Infirmary, Sheffield; Visiting Physician, Montagu Hospital, Mexborough. London: Humphrey Milford, Oxford University Press. 1934. Pp. 166. 7*s.* 6*d.*

2. Hypertension and Nephritis

Third edition. By A. M. FISHBERG, M.D., Associate Physician to Beth Israel Hospital; Associate in Medicine, Mount Sinai Hospital, New York City. London: Baillière, Tindall and Cox. 1934. Pp. 668. 32*s.* 6*d.*

1. Dr. Platt has succeeded in less than 200 pages in presenting a clear and readable account of the main features of nephritis. Beginning with a chapter describing the anatomy and physiology of the kidney, in which his views are largely based on those of Cushny and Verney, he proceeds to describe the main changes in renal function occurring in disease. His discussion of the relative importance of such factors as the diminution of the serum protein and salt-retention in the production of œdema is lucid and well reasoned, and the third chapter which deals with tests of renal function is particularly valuable in that the tests given are fully up to date and prolixity is avoided. In later chapters Dr. Platt illustrates various types of disease by examples from his own experience. It is perhaps unfortunate that he should not have separated the various types of disease which are usually included in the term "eclampsia," and it is perhaps possible at the present day to discuss the treatment of that condition with rather greater assurance than the author feels to be justified. Essential hypertension is disposed of in a chapter of nine pages and brevity has perhaps been carried too far, for the less instructed reader may fail to recognise the importance of many features of the disease described. The occurrence of papillœdema is, for example, not mentioned, and throughout the book the description of various ocular manifestations in nephritic and hypertensive states might be amended. In spite of these small defects, few, if any, better books on this subject are available at the present time.

2. For the earnest student, eager to get clear knowledge concerning diseases of the kidneys, the appearance of the third edition of Dr. Fishberg's book provides a great opportunity. To the physician versed in this branch of medicine it is an event. Considerable additions and alterations have been made. The subjects of extrarenal nitrogen retention, hypochlorræmia, and albuminuria due to cerebral lesions are amongst the more important additions, whilst those interested in therapeutics will find the use of salyrgan, magnesium sulphate, and acacia fully discussed.

The last edition of Dr. Fishberg's book appeared in 1931. The present volume is larger by over 50 pages, and it may perhaps be asked whether the author will not next produce a magnum opus in several volumes together with a short handbook more suitable to the purse and desires of the student. Whether he does so or not the existing form of his book is unquestionably a very fine presentation of the subject. Every chapter is admirably documented with references, neither the ancient nor the latest investigators escape the eye of the writer; at the same time Dr. Fishberg never loses sight of the fact that nephritis and hypertension are diseases which must remain in the care of the general practitioner, that laboratory facilities on an extensive scale are not always available, and that the practical outlook is essential.

The book is one which should be read and re-read by student, physician, and pathologist.

Moderne Therapie der Neurosyphilis

By BERNHARD DATTNER, Dr. Med. et Jur., Vienna. Vienna: Wilhelm Maudrich. Pp. 334. RM.22.

THAT a monograph of over 300 pages should be required for a full examination and discussion of present-day methods of treating neurosyphilis is surely a striking commentary on their unsatisfactory nature. Were treatment as specific as the treponeme appears to be there would be one method, and one alone, just as typhoid fever and diphtheria can be successfully and specifically combated. But the existence of therapeutic variety and diversity can only mean that no one procedure is reliably curative. Dr. Dattner's review covers the whole field of general paralysis in convenient fashion; he makes six classes of technique—viz., treatment by (1) infective disease, (2) avirulent material, (3) unspecific chemical substances, (4) new specific medicaments, (5) physicochemical methods, and (6) sunray and personal blood injections. Each is discussed critically, weighed in the balance, annotated, and summarised. For tabes a similar line is followed, but there is more to be said of symptomatic treatment here, as perhaps is natural. The treatment of cerebro-spinal syphilis is also described.

On the whole, we consider that the usefulness of tryparsamide is under-estimated by the author, and the value of malaria and recurrent fever technique rather overstressed. None the less no one can fail to note how much the burden of treatment has been lightened by methods in vogue to-day, and how general is a feeling of hopefulness. The book is enriched by numerous tables and illustrations, and provides also a summary of lumbar puncture procedures and tests.

External Diseases of the Eye

By DONALD T. ATKINSON, M.D., Consulting Surgeon to the Santa Rosa Infirmary and the Nix Hospital, San Antonio, Texas. London: Henry Kimpton. 1934. Pp. 704. With 479 engravings. 35*s.*

THE details of external diseases in this book are profuse. About 150 pages are devoted to diseases of the eyelids alone; these include congenital anomalies, affection of the skin, fungus diseases, tumours and operations on the lids. For ptosis, five different operations are described, but there is no reference to operations which utilise the superior rectus muscle or to Hess's operation. Clinically we miss any warning of the danger to the cornea if inefficiently protected after any operation for ptosis. No less than 12 operations for ectropion are described and 10 for entropion, but not the simple operation of excising skin and muscle for spasmodic entropion of the lower lid. For lacrymal disease Heller's (misprinted "Müller") procedure for excision of the sac is described—not so fully as it deserves, and though

Toti's and West's operations are not referred to, the author advocates the temporary insertion of a rubber drainage-tube through an opening into the nose. The chapters on conjunctival and corneal diseases are on a similar scale, but so much space is devoted to rare conditions that the commoner ones are apt to get crowded out. Angular conjunctivitis, for instance, is only referred to in passing, and the specific effect of zinc sulphate on the Morax-Axenfeld bacillus is not mentioned. The bacteriology of the conjunctiva, which is of great practical importance, finds no place in this book.

Besides external diseases, properly so-called, there are chapters on the iris, ciliary body, lens, and on glaucoma. These subjects are not dealt with in the same detail as the rest, and there is no reference to fundus conditions, even in glaucoma. The usual operations are described and illustrated. The subject of refraction is outside the scope of the work. In the chapter on the eye muscles several operations are described, but no adequate treatment of concomitant squint is described and no reference to its orthoptic treatment.

On the whole the work is valuable, chiefly as containing accounts of a number of rare conditions such as yaws and leprosy and rare fungus diseases, which will with difficulty be found elsewhere. The numerous drawings in black and white are clear and useful, and so are the many photographs, taken not directly from a patient but from wax models. Four interesting drawings illustrate the results of optical iridectomies or iridotomies, in which the author succeeded in restoring useful vision to patients previously given up as blind.

Operative Gynecology

By Dr. H. V. PEHAM, Privy Councillor, Professor of Obstetrics and Gynecology; Chief of the I. Frauenklinik of the University Vienna; and Dr. J. AMREICH, Privatdozent for Obstetrics and Gynecology of the University, Vienna. With an introduction to the edition in English by GEORGE GELLHORN, M.D., Professor of Clinical Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Mo. Authorised translation made by L. KRAEER FERGUSON, M.D., Associate in Surgery, University of Pennsylvania. London: J. B. Lippincott Company. 1934. Two volumes. Pp. 779. 5 guineas.

WE agree with Prof. Gellhorn, who in his introduction, says that the authors deserve much credit for having made this monumental work accessible to the English-speaking public. The first volume deals with such matters as the design and management of the operating theatre, the nature of anæsthesia advised, and post-operative complications. The last eighty pages contain a detailed description of the relations in the pelvis, the blood-vessels, nerves, and lymphatics, and the ureters. In the second volume are descriptions of the actual operative procedures recommended. The authors have chosen to describe in detail one, or at most two, operations for the surgical cure of any condition. The treatment of cervical cancer receives keen attention, and the chapter devoted to it includes a quantity of carefully collected statistical data on the end-results that may be expected. For the cure of prolapse the orthodox repair of the pelvic floor is advised; vaginal hysterectomy is not considered in this connexion. For prolapse associated with urinary incontinence it is claimed that the best results are obtained by the interposition operation. Baldy's operation is recommended for the operative correction of a retroverted uterus, and vaginal operation for the repair of bladder fistulæ.

The production of the work deserves high praise. Almost all the illustrations, and they are extremely numerous, are original, and the artist, Karl Hajek, has faithfully reproduced the pictures familiar to those who have wide clinical and surgical experience, and the operative details are shown so clearly that the procedure is easy to follow. Paper, type, and arrangement are alike excellent. This work will appeal to all interested in gynæcological surgery, but it will be most appreciated by the young specialist. As Prof. Gellhorn remarks, so complete are the descriptions, so exhaustive is the recital of technical minutiæ, and so impressive are the pictures that the reader may well imagine himself present at the operation.

Diseases of the Spinal Cord

By WILLIAMS B. CADWALADER, M.D., Professor of Clinical Neurology, University of Pennsylvania Medical School. London: Baillière, Tindall and Cox. Pp. 204. 29*s*.

Dr. Cadwalader's unambitious and handy book on diseases of the spinal cord is intended for the student of medicine, neurologist, surgeon, and general practitioner; as such, it ought not to vie with more elaborate text-books on the one hand, or with mere vade-mecums on the other. A serious endeavour has been made to set down in concise and accurate fashion the cream of present-day lore in regard to the subject, so that no reader will be disappointed. This is a difficult matter, as Dr. Cadwalader is well aware; but he has discharged his task with considerable success. He gives us evidence of original investigation as well as of wide knowledge of the literature; his descriptions are compact and tidy, as befits his aim; the illustrations, clinical and pathological, are well chosen. There is little in the volume with which any will disagree; perhaps the author rather over-states his case in claiming that primary lateral sclerosis is "now accepted as a distinct entity"; and it is premature, surely, to hold that muscular dystrophy, Thomsen's disease, and certain other conditions here examined are dependent on disturbances of the sympathetic system.

Whither Medicine?

By JOSEF LOEBEL. Translated by L. M. SIEVEKING and I. MORROW. London: Sidgwick and Jackson. 1934. Pp. 296. 7*s*. 6*d*.

THE curious title of this book was no doubt chosen in the belief that a knowledge of the past is of interest only as a guide to the future, for in simple language it is a semi-popular history of medicine and the medical sciences. It deals less with facts—though plenty of these are stated—than with general trends of outlook and atmosphere, and it will be found interesting reading by those who have a liking for a mildly philosophical outlook. It preaches sound general doctrine, such as for example that the body works as a whole, and the details seem to be, in the main, as accurate as one can expect from an author who attempts to cover such a large field. The translation is efficient, though one rather doubts whether such expressions as the "precipitation" of sugar on page 90, and the "pus" of a cerebral tumour on page 181 really represent the sense of the original.

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BACTERIOPHAGE IN CHOLERA

D'HERELLE'S early thesis "that the bacteriophage might be used as a benign parasite to wage war upon pathogenic organisms for the benefit of man and beast" [1] naturally aroused more than academic interest, and reference to our columns over the past four or five years will provide sufficient testimony to the energy with which his idea has been pursued. Such a study will, however, make equally clear that in the now considerable mass of literature on bacteriophage therapy there has so far been lacking any substantial measure of agreement about the results obtained and about their proper interpretation. This absence of precision or finality as the outcome of much experimental work has led us repeatedly to urge that only by test on a large scale, carried out with adequate controls, recorded fully and accurately and evaluated statistically, can there be any hope of determining the preventive and therapeutic value of this agent. In 1931 Lieut.-Colonel J. MORISON, addressing the section of epidemiology of the Royal Society of Medicine,[2] whetted appetite for such a formal trial with a preliminary account of the field experiments being carried out in India. Since then these tests have been continued and extended under his direction with the assistance of Dr. E. MILFORD RICE and Dr. B. K. PAL CHOUDHURY, under grants from the Royal Society and the Indian Research Fund Association. The work now extends, therefore, over a period of several years, and the April issue of the *Indian Journal of Medical Research* contains a detailed statistical examination of the large amount of material collected and the results so far reached. This report, which needs close consideration, is divided into four sections. In the first the discussion turns upon the incidence of cholera in areas in which bacteriophage has or has not been utilised as a means of prevention. The second gives an account of district epidemics in villages and upon tea estates. In the third the fatality-rate of treated cases is examined, and in the fourth statistics bearing upon the influence of bacteriophage therapy upon infectivity are analysed.

To measure the effect of bacteriophage upon incidence, two districts in the province of Assam were selected, Nowgong and Habiganj. Each contains a population of over half a million persons, and possesses a dying river, along which, as MORISON has shown, cholera tends to appear; both are situated in the plains, but they are 140 miles apart in different river basins. In Nowgong the distribution of bacteriophage began in December, 1929, in Habiganj not until June, 1932, so that in the latter at present the experimental period is too short to be of service. As controls to the experience in Nowgong the authors take (1) the previous incidence of cholera in the area and (2) the contemporary incidence of cholera in distant Habiganj, and also in similar areas more closely situated. In Nowgong the deaths per 10,000 of the population have been, for 1930, 0·99, for 1931, 0·78, for 1932, 0·46, and for 1933, 0·36. Examination of the death-rates between 1906 and 1929 shows that the lowest previously recorded in the area were 1·34 in 1918, 1·42 in 1920, and 1·62 in 1923. There has been no previous recorded period in which the death-rates for four consecutive years have been comparable with those of 1930 to 1933. The distribution of bacteriophage has thus been associated in time with an abnormally low mortality from cholera. In space, the comparison lies mainly between Nowgong and the district of Darrang, which adjoins Nowgong on the opposite bank of the Brahmaputra. Between 1906 and 1929 there was a considerable degree of association between the level of their death-rates from cholera in each month of the year; between 1930 and 1932 there was none. The mortality both in the adjacent area of Darrang and in the more distant area of Habiganj showed no decline in 1930 to 1933 on the scale of that experienced in Nowgong. "Something," it is said, "has happened in Nowgong which has not happened before and has not happened in the control areas." Of that there seems to be no doubt; but is that "something" the result of the distribution of bacteriophage? The answer must be that the association both in time and space is *perfectly consistent* with that hypothesis, but on the other hand the present limitation of the observations both in time and space makes it impossible to accept the results as yet as definite proof of cause and effect. We cannot be sure that some one or another unknown variable, that may affect the incidence of cholera, has not also changed in Nowgong concurrently with the administration of bacteriophage. For instance, the figures show that in Darrang, the death rate, taking the average of three year periods, fell steadily from 1924–26 to 1930–32, and in 1930–32 was lower than had ever previously been recorded, though remaining at a level considerably above that of Nowgong. A longer period of observation, an extension of the therapy to other areas, will eventually strengthen what is at present a striking and suggestive result.

Further evidence favouring the efficacy of bacteriophage is, however, available in the other sections of this report which deal with fatality and infectivity. In so fatal a disease as cholera the ideal method of evaluation, the use of bacteriophage on alternate cases in villages, was not possible; "it would certainly result in a riot should one form of treatment seem less efficacious than another." The method of analysis, therefore, in comparing treated with untreated cases has been to examine carefully all other factors that might, it was considered, differentially affect the fatality rate —e.g., age, sex, caste, and period of the epidemic

[1] See THE LANCET, 1932, ii., 198. [2] Ibid., 1931, ii., 1311.

in which the cases occurred. For such study results are available from two epidemics.

The first, in Sibsagar, is divided into three consecutive periods of time, and the fatality rates of the treated and untreated are thus compared at, broadly, each stage of the epidemic. In each of these periods the cases treated with bacteriophage within 48 hours of onset were observed to have an appreciably lower fatality rate than the untreated cases—namely, 24·6, 23·5, and 20·0 per cent. as compared with 51·8, 40·4, and 34·9 per cent. in the untreated. From the results it appears that the bacteriophage-treated patients had their greatest advantage in the earlier and more fatal stage of the epidemic. As the virulence declined, as measured by the decreasing fatality rate of the untreated, the fatality of the treated remained approximately constant—a rather curious phenomenon. Such a form of comparison, however, as the authors point out, may unduly favour the treated group of patients, for cholera is in some cases so rapidly fatal that even when treatment is at hand every case has not the same chance of treatment. The untreated will inevitably have more deaths, for they include the severest cases. To allow for this, the authors adopt the process of excluding from the untreated group all deaths that occurred on the first day of illness, while making no alteration in the treated group. Still it was found that the untreated suffered a greater fatality rate than the treated, while from further analysis it appeared that the administration of bacteriophage upon the first day led to the greatest reduction in mortality. In a second and more virulent epidemic than that of Sibsagar—in the Darrang villages—the mortality in the treated group was nearly half that in the untreated; after, on the principle explained above, deducting the fulminating cases from the untreated group and leaving the bacteriophage group untouched, the fatalities were 78·1 per cent. for the untreated and 44·4 per cent. for those receiving bacteriophage within 24 hours.

Here again we have a strong prima facie case in favour of bacteriophage but we hesitate to accept it as more than that. The authors have certainly done all in their power to prove an equality of characteristics between the treated and untreated groups, but in the absence of a deliberately random allocation of cases to each group one cannot escape the question whether some unknown and possibly important factor may not have been responsible for the fact that "Mr. X" is found amongst the untreated and "Mr. Y" amongst the treated.

To say that rigid proof is still lacking is not to underrate either the importance of the work that Colonel MORISON and his associates are carrying out or the value of the evidence they now put forward. Extension of their observations in time and space must place their case for the prevention of cholera by means of bacteriophage on a firmer foundation, and we trust that such an extension will be found possible. The case for treatment is more difficult. Further observations on the same lines can hardly do more than confirm the present result without making it any more secure. A random distribution of cases to the treated and untreated group is the only unassailable mode of procedure, but it is a method that demands, in dealing with human beings, two perhaps impossible requirements—namely, a complete lack of faith in the therapeutic agent employed, and a population "at risk" to which the test can be applied without the differences in the treatment given being conspicuous. Perhaps it is only in fiction that such a situation could be created.

TUBERCULOUS MENINGITIS

THE accepted teaching of the pathogenesis of tuberculous meningitis is that it is a part of a general miliary tuberculosis, the blood stream carrying all over the body large numbers of bacilli derived from some focus of disease in the thorax, abdomen, or elsewhere, and the meninges of the brain sharing in this general infection and then becoming the seat of inflammation and exudation. This doctrine has been challenged by RICH and MCCORDOCK as a result of a careful anatomical study of the brain and spinal cord in 82 cases of tuberculous meningitis,[1] and quite a different explanation of the origin of meningitis was suggested by them. By careful and complete sectioning of the brain and cord they found in all but 5 of their 82 cases one or more caseous foci in close proximity either to the meninges or to the intraventricular surfaces, and actually extruding caseous material into the subarachnoid space or the ventricles. In the 5 cases where the examination was incomplete, older foci were occasionally found, although evidence of their communication with the surface was not obtained. These foci were visible to the eye, but most of them were beneath the surface of the brain and would easily escape detection in any but a very searching examination of the brain. This proof of the existence of older caseous tuberculous foci in the brain in practically every case of tuberculous meningitis led the authors to the conclusion that the disease results from a local infection with caseous material, heavily loaded with tubercle bacilli, rather than from miliary tubercles in the meninges. It is true that in most cases of tuberculous meningitis, especially in young children, there is also a general miliary tuberculosis which includes the surface of the brain; but in a significant number tuberculous meningitis is present without general miliary tuberculosis. Further in support of the view of RICH and MCCORDOCK is the common experience of finding miliary tuberculosis of the lungs, the liver, spleen, and kidneys, without any exudative inflammation of the pleura and peritoneum in close proximity; while yet another point in favour of their theory is that it gives a better explanation of variations in onset and course of the meningitis. The discovery of older tuberculous lesions in the brain in nearly all cases of tuberculous meningitis suggests an analogy with the primary Ghon focus in the lungs. The analogy is not complete, but it goes some distance. In the brain, as in the lung, there is a primary deposit. In both organs it is a small focus and has to be searched for with special care or it will be missed. In the lungs it is deposited by the airways; into the brain it is carried by the blood stream. In the lungs it is generally single; in the brain it is often multiple.

RICH and MCCORDOCK'S theory would serve to explain the occurrence of such rare cases as are reported on another page by Dr. MACGREGOR,

[1] Bull. Johns Hopkins Hosp., 1933, lii., 5; see also THE LANCET, 1933, i., 651, and 1933, ii., 192.

Dr. KIRKPATRICK, and Dr. CRAIG, in which a few tubercle bacilli find their way into the cerebro-spinal circulation from an adjacent focus, but fail to set up meningitis. In these cases infection of the cerebro-spinal fluid by tubercle bacilli was proved by animal inoculation. The children all reacted to the tuberculin test, but they neither showed the clinical features of tuberculous meningitis, nor did they develop this complication after a period of many months. In two of the cases the cerebro-spinal fluid was practically normal in its chemical and cellular constitution, and here the type of bacillus was bovine; in the third, the fluid showed an inflammatory reaction similar to that of tuberculous meningitis and was found to contain bacilli of human type. (Of the 214 cases of tuberculous meningitis analysed by Dr. A. S. GRIFFITH in our last issue about a quarter were due to bovine bacilli.)

The interesting results recorded by MACGREGOR, KIRKPATRICK, and CRAIG were obtained in the course of a study of tuberculous meningitis in children which is still proceeding, and which attempts to correlate its clinical, morbid, anatomical, and bacteriological aspects. They are significant in several ways. They are not presented as examples of recovery from tuberculous meningitis—a rare event of which a certain number of authentic cases are on record, occurring nearly always in older children and adults. They belong to the still rarer group of tuberculous infection of the cerebro-spinal fluid without meningitis. The occurrence of three cases of this kind in the course of one investigation suggests that this condition may be commoner than has been believed. In such cases a general miliary tuberculosis as the result of a heavy infection seems impossible, although there remains the possibility of the escape of a few bacilli from the choroid plexus. The further history of the cases will be of great interest, since their significance is much greater than that associated with rarity. When studied alongside cases of typical meningeal disease they should add considerably to our knowledge of the pathology of tuberculous meningitis. It is desirable that so fatal and so common a disease should be studied in one comprehensive investigation; the new observations on the morbid anatomy of the disease must be tested and verified; the bacilli must be typed; and a complete neurological record of the cases must be made so that clinical and pathological observations may be correlated. When we remember that tuberculous meningitis is not a primary disease; when we are now told that the meningitis is the result of an older focus of disease which may be here, there, or anywhere on the surface or in the interior of the brain, and that the choroid plexus and the spinal cord must not be forgotten; and when we realise that this older local deposit in the brain has come from a primary focus of disease in the thorax, abdomen, or almost any part of the body, we begin to appreciate the labour entailed by a thorough study of the disease from its beginning to its fatal close. Such a task is, of course, beyond the powers of an individual; the collaboration in the Edinburgh investigation of a morbid anatomist, a bacteriologist, and a clinician gives promise of valuable results from the completed study.

THE CHILD WITH POOR SIGHT

"BLINDNESS," as it affects children, was defined by the Education Act of 1921 as "too blind to be able to read the ordinary school-books used by children," and this definition has been extended in practice to cover all whose sight will probably be made worse by following the regular school curriculum. To call these children blind is not only incorrect but harmful, for it creates a quite unnecessary feeling of dread both in the children and their parents. The first recommendation of the Board of Education Committee,[1] presided over by Dr. RALPH CROWLEY, is that no child should be certified as blind who is unlikely to be put in the class designated by the Blind Persons Act of 1920 as "so blind as not to be able to perform any work for which eyesight is essential." The committee was invited to consider the problems of the "partially blind," and it begins its report by asking permission to call them "partially sighted." This group comprises first, those who cannot follow the ordinary curriculum but can see well enough to be taught by special methods involving the use of sight, and secondly, those suffering from conditions such as myopia, which may be aggravated by following the ordinary curriculum. Most myopic children see well, both at a distance and near at hand, when their refraction is properly corrected; it is on grounds other than defective vision that they need special treatment. Some ophthalmic surgeons indeed doubt whether normal school work has any deleterious effect on their eyes. It is certainly right, however, to take special precautions during any stage of progression as shown by an increase of refraction of more than 1 D a year, by active ophthalmoscopic changes, by deterioration of vision, or by myopia high in relation to the age of the child such as −4 in a child of 6 or −6 in a child of 10. As to partially sighted children who are not myopic but have corneal nebulæ, congenital defects, or cataract, for example, it may be said that those with a visual acuity after correction of 6/24 or worse, with a near vision of J 8 or J 10, need special arrangements. To these may be added those with diseases liable to be progressive, such as optic atrophy and retinitis pigmentosa.

Owing to difference of opinion about the degree of myopia requiring special treatment, it is not really possible to give any estimate of numbers; but the report assumes that it is needed by something like 6000 children (myopes and non-myopes) in England and Wales. Of these about 2600 are already in schools for the partially sighted or in blind schools, and this means that some special educational provision is needed for rather more than 3000 others. The ways in which these children are now being educated and the improvements

[1] The committee was appointed in 1931, and its report, just published and entitled "Partially Sighted Children," is obtainable from H.M. Stationery Office. 3s.

that ought to be introduced are fully discussed in the report. Special schools, or special classes in ordinary schools, are maintained by 22 different local authorities. Of these London has led the way, having 11 different schools or classes, while Liverpool has 6 special classes, all of them attached to ordinary schools. In sparsely populated areas there is much greater difficulty. For children whose disability is not great the ordinary schools can be used if individual attention is possible—this depending largely on the amount of interest taken in them by the headmaster and on the supervision of the ophthalmic surgeon. Sometimes the only alternative may be a blind school, but the committee hopes that the Board of Education will take immediate steps to require that schools for the blind should admit or retain partially sighted children only if special provision is made for their education by sighted methods. It further suggests that the Board might bring about a reorganisation of the residential blind schools so as to set aside some for partially sighted children only. Otherwise the children are taught by methods which will not fit them for post-school life, and on reaching the age of 16 they are turned out into the sighted world ill-equipped educationally and socially and bereft of the assistance which is available for registered blind persons. Special schools for the partially sighted are now supplemented by special classes in ordinary schools, and the report is largely concerned with the relative merits of these two systems. The special school involves segregation of the children from their sighted mates and the disadvantages of this are so great that in spite of administrative difficulties the committee leans decidedly to the plan of special classes in ordinary schools. Whenever possible, it feels, partially sighted children should be educated in classes forming an integral part of ordinary elementary schools. One objection to the special schools, as at present conducted, is that in most of them no difference is made in the educational treatment of myopes and non-myopes.

It is the duty of the ophthalmic surgeon, in the light of his periodical findings, to advise what modifications of the curriculum such as the extension or curtailment of close work or of physical exercises should be made in any particular case. Difficulty often arises over scholarships, but the surgeons consulted by the committee offer little or no evidence that the unrestricted curriculum of the secondary school has proved directly responsible for deterioration of vision of myopic children attending it; and the report maintains that if a child has gained a scholarhip to a secondary school the question whether he should be debarred for ophthalmic reasons from benefiting by it ought to be decided only on consideration of the circumstances and not according to rule. As to the curriculum itself, there are two subjects inviting comment. In the first place myopes in special schools are now commonly forbidden to read at all, and the committee wants to remove this restriction in the case of all but very high myopes or those with serious fundus changes or evidence of rapid increase of myopia. Others should be permitted to read any printed matter that is easily legible to them with their glasses at a distance of about 14 in., with the ordinary precautions against stooping. Secondly, as to physical exercises, at present there are certain restrictions on the syllabus for ordinary schools; for instance, skipping and jumping are forbidden, presumably because myopes are specially liable to detachment of the retina. Unless however there is high myopia, or myopia with fundus changes, this danger is so remote for children that it is legitimate to disregard it. Save in the circumstances just mentioned, the myopic child should be allowed to pursue the full physical training syllabus with the exclusion of exercises which involve sustained bending of the body forward and downward. For those with acute or subacute inflammation in the eyes (trachoma, obstinate phlyctenular disease, or interstitial keratitis) a special hospital school at Swanley is provided. The committee points out that a similar one for the north of England is badly needed.

ANNOTATIONS

THE CAMBRIDGE MEDICAL CURRICULUM

THE end of the May term at Cambridge saw the final seal of approval set by the Regent House on the proposed alterations in the examinations for medical degrees. Details will be given in our forthcoming educational number, but it may be convenient to state here the main effect of the changes.

It will be remembered that as long ago as 1931 a syndicate was appointed to inquire into certain difficulties which had arisen and to suggest remedies. The University authorities were struck with the diminishing proportion of medical students who entered for the Natural Sciences Tripos. Whereas at one time almost all did so, soon after the war only 77 per cent. entered. Finally only 44 per cent. embarked on an honours course. The duplication of examinations was a factor in this: students felt it an unnecessary burden to take up for examination the subjects of anatomy and physiology both for the second M.B. and for the tripos. The first step proposed was therefore to exempt from the second M.B. those who reached a qualifying standard in these subjects in the tripos. The next was to include such subjects as general pathology and biochemistry in the first part of the tripos and not merely in Part II., which is only taken by the more advanced students. The syndicate's first report presented in June, 1932 (THE LANCET, July 30th, 1932, p. 256), and discussed by the Regent House in the following October, implemented these changes by the establishment of a Medical Sciences Tripos. This proposal aroused strong opposition on several grounds. Many considered it undesirable to segregate medical students from others working at natural sciences, and some feared for the prestige of the Natural Sciences Tripos if it were in effect thus divided. Others contested hotly that general pathology and biochemistry were subjects of vocational and not of educational value, but were not very convincing in their attempts to discriminate between the two.

The report was therefore referred back to the syndicate and a more acceptable solution was found. But the first report had not been fruitless; it brought out clearly the urgent need for change. Realising this, the Natural Sciences Tripos committee met the syndicate in a generous spirit, with the result that these changes have been accommodated within the four corners of the Natural Sciences Tripos. Another important alteration is that it is now compulsory for a medical student to attain a honours standard in some tripos, not necessarily the Natural Sciences Tripos, before he can proceed to the final M.B. examination. This at once raises the M.B. Cantab. to the status of a honours degree; those who do not wish to read for honours are not excluded, but they will have to content themselves with the diplomas as many now do. It is anticipated that insistence on the attainment of a honours standard in a tripos will reduce the number of rejections in the later M.B. examinations.

The normal course of events for a medical student at Cambridge will therefore run as follows: He can take his first M.B. examination either before or soon after entry. Organic chemistry will now be transferred from the second M.B. to form Part IV. of the first M.B. Physics and mechanics will be telescoped into one part, the remaining parts being inorganic chemistry and general biology. If a student fails to reach the required standard in anatomy and physiology in the Natural Sciences Tripos, or if he has taken some other tripos, he will have to pass a qualifying examination in the defective subject or subjects in the following October or December. If he entirely fails to reach a honours standard he must take the examination again as a qualifying test. The first part of the tripos can be taken at the end of the second or of the third year. Students will, however, be encouraged to take three years over their preparation for it, unless they are considered sufficiently good to proceed to the second part of the tripos. The remaining part of the second M.B., known to generations of students as "Bugs and Drugs," will disappear. An oral examination will be held in pharmacology, and optional questions will be set in that subject in the physiology papers of the tripos. It will be necessary to attend a course of instruction in pharmacology in Cambridge or at some other approved school. A separate examination in general pathology is held to be no longer necessary since it will be a subject of examination in the tripos and in the final examination. The net effect of this will be that a student who enters Cambridge having passed his first M.B. need have no examination beyond his tripos and an oral test in pharmacology until he reaches the finals. And it may be claimed that this change has been effected without in any way impairing the educational value of his training, but in effect enhancing it. All students entering the University from now on will come under these new regulations.

A good deal of unnecessary apprehension has been aroused in the minds of Cambridge medical graduates with regard to the changed regulations for proceeding to the M.D. As before, a thesis will be required, but it has been felt that, in the past, making the thesis the sole requirement has, in effect, discriminated unfairly against those engaged in practice compared with holders of laboratory appointments. The latter are in a better position to compose a thesis on academic lines than are the former. A candidate may therefore present a thesis either of such a standard as will exempt him from further examination or he may thereby establish a prima facie claim to be allowed to show clinical knowledge in the special branch with which his thesis deals. It is not intended to make it harder to obtain the M.D., but to make the conditions fairer for men whose clinical knowledge and experience entitle them to the higher degree.

POST-OPERATIVE PULMONARY COMPLICATIONS

PULMONARY complications continue to rank high in the list of the risks attached to major surgery. In a recent communication H. F. Griffiths[1] has analysed a large series of cases and has drawn some interesting conclusions about the pathogenesis of these complications. He finds that bronchitis and pneumonia occur no less commonly after regional or spinal anæsthesia than after the more commonly used general anæsthetics. At the same time he confirms the general belief that the incidence is largely confined to operations involving the peritoneal cavity, particularly when upper abdominal incisions are used. These facts indicate that it is the site of operation rather than the method of establishing anæsthesia that is mainly responsible. The real trouble, as has been suggested previously in these columns, seems to be that a patient with an abdominal operation wound will not cough if he can avoid doing so, and his bronchial secretions accumulate to set up infection. It is for this reason that, as Griffiths points out, hyperventilation induced by carbon dioxide does no good and may actually make matters worse, except in the comparatively rare cases of massive collapse of the lungs. Griffiths finds that the incidence of pneumonia is greater in the winter months, and that men are afflicted more commonly than women, possibly because they smoke more heavily. There seems to be little reason at present for hope that means will be found to prevent chest complications, since the only way to avoid a painful abdominal incision would be to avoid operating on the abdomen.

FROM THERAPEUTIC TO ACCIDENTAL MALARIA

THE Wagner-Jauregg treatment of general paralysis by inoculation with malaria has for some years been looked at askance by those who have foreseen in this practice the possibility of malaria becoming endemic in areas where it has hitherto been absent. A discussion occurred in July, 1929, at the Congrès de Dermatologie et de Syphiligraphie in Paris, when on the one side this issue was held to be impossible on account of the alleged absence of sexual elements in the blood of the inoculated patients, while on the other side experimental evidence was produced in controversion of this hypothesis. A disquieting, concrete contribution to the solution of this problem was made on May 15th of this year by Dr. R. Martin, Dr. Chassigneux, and Dr. Rouëssé in a communication to the French Academy of Medicine. The case they cited was that of a woman of 24, who had never left France, and who had lived uninterruptedly near Paris for several years. During August and September, 1923, she used to spend her evenings with her husband who worked as a labourer close to an asylum where the subjects of general paralysis were inoculated with *Plasmodium vivax*. She was often stung by mosquitoes, and in September both she and her husband suffered from a benign tertian fever which was promptly cured by quinine. When she had a second attack in April, 1934, *Plasmodium vivax* was found in her blood. While there can be no question of giving up such an effective treatment of general paralysis, it may well be asked if its practice

[1] Brit. Jour. of Anæsthesia, 1934, xi., 89.

is at present being safeguarded by all the desirable precautions. As pointed out at the French Academy on the occasion of this communication, the persons in charge of this treatment are assuredly experts in psychiatry. But they may be virginal neophytes in the realms of parasitology, ignorant or at least inadequately appreciative of the fact that the parasite of malaria may exist in the blood without provoking fever in its host. Also, on account of lacunæ in their knowledge, they may control the infection for which they are responsible so imperfectly that the patient harbours the malarial parasite for a year or more. The risk of malaria becoming endemic would be reduced if this treatment were to be centralised in institutions staffed by zoologists as well as by psychiatrists, and if the institutions themselves were not to be located in rural areas affording favourable conditions for mosquito life.

FLUORINE AND MOTTLED TEETH

FOUR years ago a mining community in Arkansas, U.S.A., abandoned an otherwise satisfactory water-supply on evidence suggesting that it was responsible for defective enamel formation of the developing teeth in children. The water was from a deep well and inquiry [1] by the U.S. public health service failed to establish the exact nature of the agent which caused the mottled teeth. It was not until later that a connexion was traced between the defect and the presence of fluorine in the water; in a review last year Dr. F. DeEds, of Baltimore, stated [2] that a daily intake of 0·1–0·15 mg. of fluorine per kg. of body-weight was sufficient to mottle the teeth. Cases had then been reported mostly from the western states of America and North Africa. Mottled teeth are now beginning to attract attention in this country. The *Analyst* for June contains a paper by Dr. Guy Barr and Mr. A. L. Thorogood. The National Physical Laboratory have recently examined samples of water from various localities in Essex sent them by Dr. N. J. Ainsworth, L.D.S., who discusses in the same issue the clinical significance of small quantities of fluorides in drinking water. Dr. Ainsworth had first observed mottled teeth in a young patient at Maldon, Essex, and then had gone on to examine a large number of Maldon school-children, when it became clear to him that the condition was identical with that described by Black and Mackay, in 1916, as occurring in many districts of the United States between the Mississippi and the Rockies, notably in Arizona. Dr. Barr's analyses showed that the water of areas where mottled teeth did not occur was free from fluorine, whereas water from the affected areas contained 4·5–5·5 parts per million. It seems clear from American experience that the substitution of deep-well water for that from shallow wells was a frequent antecedent of mottled teeth, some deep well water containing appreciable amounts of fluoride. Coagulation with aluminium sulphate followed by filtration will remove sufficient fluorine to render water harmless, the optimum pH for this reaction being 6·7 to 7·5, preferably near the lower figure. The amount of aluminium sulphate needed is rather large—from 17 to 34 times the fluorine present. The process of determination investigated and recommended by Barr and Thorogood is based on one described by de Boer involving the use of an alizarin-zirconium reagent which gives a pink to yellowish-brown colour with water containing fluorine. The technique described enables an amount of fluorine equivalent to 5 parts per million to be determined with an accuracy of 0·1 part. Maldon is one of the few places where there is a local industry of producing salt from sea-water, but there seems no reason to connect this fact with the occurrence of fluorosis, as Dr. Barr found that the proportion of fluorine to chlorine in sea-water was 170 times less in sea-water than in the positive well-water. The desirability of examining new sources of water-supply from deep wells by the method used by Barr or by some other trustworthy means is clearly indicated.

[1] THE LANCET, 1931, i., 982.
[2] Ibid., 1933, ii., 368.

THE INTRADERMAL REACTION IN BRUCELLA INFECTIONS

THERE are an increasing number of reports by different workers on the failure to demonstrate agglutinins in the blood in cases of undulant fever. The reason for this is not clear. It may be that unsuitable strains are used for the agglutination test, or that the suspensions are rendered insensitive by the severe treatment with formol or other reagents. Or again it may be that the range of serum dilutions tested is so narrow as to fall within the pro-agglutination zone. These possibilities are mentioned in order that they may be taken into account before the definite conclusion is reached that agglutinins are absent. Whatever the explanation, there is undoubtedly some dissatisfaction with the agglutination test, leading many workers to make use of the intradermal allergic reaction. Though the antigen employed in this test was originally a filtrate of an old broth culture, it seems clear that a simple saline suspension of organisms from an agar culture is equally effective. E. Arbatskaia and H. Moroskin [1] record some results obtained with a brucella suspension heated to 70° C., and standardised to an opacity similar to that given by 2000 million *coli* per cubic centimetre. The intradermal injection of 0·1 c.cm. of this reagent gave rise in allergic patients to an erythematous reaction which became noticeable in 6–8 hours and reached its maximum in 24–48 hours. Besides the erythema there was a red, tender, indurated swelling, sometimes accompanied by a slight rise in temperature and enlargement of the axillary glands. Pseudo-reactions developed within a few minutes, but disappeared completely within 24 hours. Of 35 undulant fever patients tested, 21 gave a positive blood culture, 30 a positive agglutination, and 34 a positive intradermal reaction. Five patients with an absence of agglutinins reacted to the intradermal test, while only one patient with agglutinins gave a negative skin reaction. Non-specific positive reactions were observed in 11 out of 36 tuberculous patients, but when the strength of the bacillary suspension was reduced to 500 million per cubic centimetre, they no longer occurred. In their conclusions Arbatskaia and Moroskin recommend the use of a reagent of this strength in order to avoid occasional skin necrosis and non-specific reactions in highly sensitive patients.

While the interpretation of a positive agglutination reaction is fairly well understood, it is still doubtful what significance should be attached to a positive intradermal reaction. Is it, like the tuberculin reaction, a mere index that the subject has at some time or other been infected with the specific agent, or does it indicate that infection is active at the time? J. D. Goldstein [2] recently tested 253 unselected hospital patients in Rochester, N.Y., using a saline suspension of three-day liver agar

[1] Giornal. di Batt. e Immunol., 1934, xii., 979.
[2] Jour. Clin. Invest., 1934, xiii., 209.

slope cultures of *Br. abortus*, killed by heat at 60° C. for one hour, and standardised to 500 million per cubic centimetre. Twenty-six patients injected with 0·05 c.cm. of this reagent reacted positively. Of these, only five had an agglutinin titre of 1/80 or over, while 13 gave histories indicating possible sources of infection with *Br. abortus*. The conclusion drawn by Goldstein from these observations is that the intradermal test is of value in patients with undiagnosed pyrexia, and in afebrile patients without agglutinins whose symptoms may nevertheless be referable to a brucella infection. This conclusion may be correct, but it is certainly going beyond the facts. Far more information is yet required about the development, the intensity, and the persistence of a positive skin reaction in latent and in overt brucella infections before it will be justifiable to diagnose active infection on the basis of this reaction alone. Ample opportunity exists for survey work on the frequency of this reaction in exposed and non-exposed populations and in pyrexial and apyrexial patients.

RADIATION THERAPY IN CANCER

THE principles which should guide radiation therapy are being eagerly sought in every part of the world where this comparatively new weapon in the war against cancer is being tried. Many observers are devoting their attention to the quantity and equal distribution of the energy used, and to the study of biopsy material and of cancer tissue cultivated in vitro, with the object of noting the radio reactions induced by varying the doses and time-spacing, and establishing a more or less standardised dosage. Dr. Henri Coutard, as will be seen by those who read his lecture printed on another page, approaches the problem from a different angle. His work is based entirely on exceedingly careful observations of clinical facts. From these observations, proceeding step by step, he has been able to demonstrate that whereas in cancers of embryonic type the factor of intensity of irradiation is of chief importance, in the case of differentiated cell growths the time factor may be of equal or even greater importance. The modification of the vasculo-connective and general tissues resulting from the use of large daily doses with an intensity per minute exceeding 5 r would not be of great importance in the embryonic type of cancer; but the same daily doses with the same intensity per minute would, generally speaking, entirely defeat their object if applied to the treatment of highly differentiated cancers. These contrasting results are thought to depend upon the specificity of the cell reaction to radiation. In the embryonic radio-sensitive type of cancer the cells are held to be destroyed directly by the intensive dose, and therefore the end-result is not affected by the modification of the supporting tissues; whereas in the case of tumours of the resistant, differentiated type, only those cells actually in mitosis are damaged early, and the final destructive effect of the irradiation is believed to depend upon the gradual maturation of the remaining cells. This effect does not materialise when the vasculo-connective tissue is substantially altered by the intensity of the daily dose; on the contrary, instead of the malignant cells becoming more sensitive, a condition of radio-resistance is produced in them. According to Coutard, avoidance of damage to the supporting tissues is therefore essential: only a slight reaction is permissible if a good end-result is to be obtained.

Having at first completely failed in the treatment of certain types of cancer, Coutard made careful observations on surface tumours, varying the daily dose and intensity. He was finally able to demonstrate that by using small daily doses of low intensity, and lengthening the total duration of treatment, success could be obtained even in radio-resistant tumours. Using this method he has achieved good results even in infiltrating cancers of the larynx. He finds that the tumour response and radiation tolerance of the vasculo-connective tissue differs in individual cases and cannot be determined in advance; he holds, therefore, "there exists no fixed method of treatment but a simple clinical treatment for each individual patient and for the special type of tumour." The laborious technique carried out at the Fondation Curie involves the concentrated attention of highly skilled workers, and on account of the length of time necessary for the treatment of each case and the quantity of apparatus required can only be carried out at special centres. Even if the particular technique used is not practicable in institutions where large numbers of patients have to be treated and relays of skilled workers are lacking, the facts ascertained at research centres such as the Fondation Curie are of the utmost value. Radiological treatment is still at an experimental stage, and premature attempts at standardisation of dosage are to be deplored. Only by developing centres for clinical study in close coöperation with research laboratories are we likely to make the best possible use of the powerful but dangerous weapon to our hand.

THE BROAD TAPEWORM IN DOG AND PIG

THE presence of *Diphyllobothrium latum* in North America has excited a good deal of interest,[1] and, according to H. B. Cushing and H. L. Bacal,[2] its incidence is increasing in Montreal. The number of patients attending three hospitals in this city for this infection between 1906 and 1928 was 13, and between 1929 and 1933 was 37, 12 of them attending last year. As to the fish which harbour the plerocercoid stage infective for man, no instance of infection was found in those caught in the St. Lawrence river; it was limited to those imported from the Great Lakes during the months when the river fish are out of season. But interest in this matter is being taken in Russia also, and the work which is being done there has not led to the same conclusions as have been drawn in America. It may be recalled that in commenting on the findings of Thomas B. Magath and Hiram E. Essex[1] (that in only 1·5 per cent. of eggs of this tapeworm passed by the dog was there development of the coracidium which infects the first larval host) we emphasised the fact that since dogs may harbour many adult worms they may pass many eggs, so that these may tend to make up in quantity what they lack in infective quality. Investigation by Wictor Tarassow[3] shows, however, that such a poor potential infectivity as this is no necessary attribute of eggs from the dog. True, these develop more slowly than do those from man, for in 14 to 16 days the coracidium has appeared in 7·8 to 9·2 per cent. of eggs from the dog as against 72 to 73 per cent. of those from man; but after 21 to 25 days the figures are just over 50 from the dog and just over 75 from man. Quite clearly it cannot be taken for granted that the dog is a negligible factor in the spread of this tapeworm to man. In this respect Tarassow has implicated the pig

[1] See THE LANCET, 1931, ii., 1089.
[2] Canad. Med. Assoc. Jour., 1934, xxx., 377.
[3] Arch. f. Schiffs- u. Trop.-Hyg., 1934, xxxviii., 156.

also as a definitive host alternative to man. He himself swallowed, and he fed to each of two pigs, six plerocercoids, the stage in the pike infective for the definitive host, and in all three instances two adult worms developed. He next dissected 15 swine from four different villages. In three of the villages fish were eaten and the offal thrown to pigs, and 8 of 11 of these harboured the broad tapeworm; in the fourth village fish was not eaten and none of 4 pigs was infected. Prophylactic measures against this worm must be given a considerably wider range than has hitherto been generally realised.

ANOTHER GENERAL ANÆSTHETIC

READERS of Dr. Bourne's paper on cyclopropane in obstetrics (p. 20) will be interested to hear of a brief article on the drug which appears in the May number of the *Magazine* of the University of Leeds Medical Society. The author, Dr. W. Stanley Sykes, has used cyclopropane so far in only a few cases, but his experience has been very satisfactory. Obviously it has great merits as a gaseous anæsthetic. It is as innocuous as nitrous oxide so far as effects on blood chemistry and on internal organs are concerned, yet it is far more potent and gives better muscular relaxation. The practical drawback to its wide employment is the high cost of its production. This obstacle is overcome, however, when well-constructed machines are used for its administration, these comprising a carbon dioxide absorption chamber, so that the cyclopropane can be breathed over and over again. The drug is now being investigated in this country under the auspices of the Anæsthetics Committee (Medical Research Council and Royal Society of Medicine) and we shall be surprised if in the future it does not secure an important place among general anæsthetics.

MECHANISM OF RELIEF OF CHEST PAIN AFTER THYROIDECTOMY

COMPLETE thyroidectomy, which is now being undertaken extensively in America for patients with angina pectoris and congestive heart failure,[1] has now been found by Weinstein, Davis, Berlin, and Blumgart [2] to relieve immediately chest pains not associated with exertion, and the skin hyperæsthesia and tenderness of the deeper tissues of the chest wall not uncommonly found in cases of chronic heart disease. The more permanent relief of angina and of the symptoms of severe heart failure which results from the removal of the normal thyroid usually sets in only some weeks after operation, at a time when the basal metabolism has undergone considerable reduction. The immediate relief of symptoms cannot be explained by the reduction of basal metabolism, and the authors suggest that the relief is due to interruptions of nerve impulses from the heart resulting from the operation, and is comparable to the effect of cervical sympathectomy. In three anginal cases in which hemithyroidectomy was done as a preliminary, exertion taken within two weeks of the operation produced anginal pain only on that side of the chest corresponding to the thyroid lobe left in situ. Between the second and eighth weeks after operation pain was again felt on the operated side, but after a second operation to remove the remaining part of the gland, and when the metabolic rate had fallen considerably, there was permament relief from angina. The thesis set out is thus that of a double mechanism—the immediate temporary relief of chest pains and tenderness after complete thyroidectomy being due to the interruption of different impulses from the heart at the time of operation, while permanent relief is dependent on the reduced work of the heart associated with the development of the hypothyroid state.

[1] THE LANCET, 1934, i., 303.
[2] Amer. Jour. Med. Sci., June, 1934, p. 753.

"MEN IN WHITE"

THE reading-room of the staff club at "St. Jude's Hospital" is not a restful place, and the resident staff who appear in Sydney Kingsley's play at the Lyric Theatre lead anything but restful lives. Loud speakers throughout the hospital keep calling attention to the fact that George Ferguson, F.R.C.S. (the hero), is wanted on the telephone; and this leads his fiancée to put her foot down and demand that he shall take surgery rather less exclusively after his approaching marriage. The conflict between love and a career is thus set going in earnest, and she finds a strong antagonist in a senior surgeon (excellently played by Mr. Lewis Casson) who wants Ferguson to abjure easy practice and serve a long and stern apprenticeship to his profession. A scene in which the young man disobeys a physician's orders and thereby saves a child's life at once endears him to the audience, and he retains our sympathy and respect through the appalling complications that arise from his relations with a young probationer nurse. These lead to a scene in the operating theatre which borders on the improbable but includes a striking exhibition of routine aseptic and antiseptic precautions. The technical side of the play is, indeed, almost beyond criticism, and Mr. Robert Douglas as Ferguson gives a consistent and convincing performance; but even after being anglicised by Dr. "Merton Hodge" the story remains faintly transatlantic in tone. Apart from the behaviour of the hospital board of governors, there was little in the play that could be called enlivening; and though many people will enjoy the chance of seeing behind surgical scenes, the central problem really makes less impression than the ingenuity with which a special department of life is presented.

Surg. Rear-Admiral R. W. B. Hall, C.B., O.B.E., has succeeded Surg. Vice-Admiral Sir Reginald St. G. S. Bond, K.C.B., as Director-General of the Medical Department of the Navy.

Dr. Robert Hutchison has been elected president of the Royal Society of Medicine for the coming year. The names of the new presidents of sections will be found in our news columns.

THE death is announced, as having occurred on Wednesday, of Madame Marie Curie, the joint discoverer with her husband of radium.

IT is announced that Mr. Edward William Meyerstein has given £70,000 to the rebuilding scheme of the Middlesex Hospital, bringing his magnificent benefactions up to the sum of £100,000.

WE regret to announce the death on Tuesday last of Sir James Kingston Fowler, consulting physician to the Middlesex Hospital and well known both for his work in relation to tuberculosis and as an authority on medical education.

THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—Applications are invited for the Wandsworth scholarship, which will be vacant in October. The scholar must undertake research in tropical medicine and will be expected to spend a substantial part of his time overseas. Further particulars will be found in our advertisement columns.

PROGNOSIS

A Series of Signed Articles contributed by invitation

IX.—PROGNOSIS IN SURGICAL TREATMENT OF PEPTIC ULCERS

"Out of this nettle, danger, we pluck this flower, safety."

THE public have long known what many surgeons have failed to grasp, that no operation is free from danger and risk of life. What every patient wants to know is the extent of this risk and the chances of ultimate cure; and yet of all branches of surgery this is the most uncertain. To be analysed and fully appreciated the results of operation have to be put in a statistical form, but when so expressed they are dependent upon so many factors that they will seldom remain undisputed. The most important duty of a surgeon is to know when not to operate, for patients who can be cured medically should never be subjected to operation; but the inclusion of many of these milder cases will do much to improve the surgeon's statistics. If surgery be imperative the wise choice of operation will not only give a lower operative mortality-rate but a higher percentage of ultimate cure, but in some cases unsatisfactory end-results compel the rejection of a relatively safe operation for one carrying a rather higher risk. Above all, the results of any one operation will largely depend upon the surgeon who performs it. One surgeon may perfect one method, another a second. Hence it is impossible to state that any one operation performed for a certain lesion will universally be followed by a given percentage of deaths or cures. Only by the study of a large series of his own cases is the surgeon able to inform his patients of the results they may expect from the procedure he advocates.

In the present article the selection of cases for surgical treatment cannot be discussed. The results are based upon a study of 1805 operations personally performed. The patients had all previously been treated medically but only 1727, which have been followed for periods of 1–21 years, are analysed.

PYLORIC AND DUODENAL ULCERS

The commonest type of peptic ulcer is that in the duodenum. At times such ulcers may extend in part beyond the pyloric vein on to the stomach and since my own experience has been that such may occasionally be followed by carcinoma, a complication which does not follow a true duodenal ulcer, they have in my own series been analysed separately. Their treatment, however, is identical and therefore for present purposes they will be considered together. Generally speaking three methods of treatment have been advocated: (1) gastro-duodenostomy, with or without excision of the ulcer; (2) gastro-enterostomy, anterior or posterior; and (3) partial gastrectomy. It is in the choice of these operations that so much divergence of opinion has been expressed by different surgeons.

It has been claimed that gastro-duodenostomy allows of direct attack upon the ulcer and is not followed by gastro-jejunal ulceration, and that partial gastrectomy, by permanently lowering the acidity, almost entirely abolishes the later onset of gastro-jejunal ulceration. It is by perfecting the technique of one or other methods that different surgeons have obtained such varying results. My own choice on both theoretical and practical grounds has been for gastro-enterostomy. By firmly embedding the ulcer the dangers of hæmorrhage and perforation are overcome, while the gastro-enterostomy is a safe procedure with very good end-results. The risk of operation should never be above 2 per cent., whereas the published statistics of partial gastrectomy even in the case of its most skilled exponents lies in the neighbourhood of 6 per cent. The danger of subsequent marginal ulceration in my own cases has been rather over 3 per cent., so that the mortality of gastro-enterostomy together with the subsequent incidence of marginal ulceration is less than the mortality of partial gastrectomy, which in my opinion should be left for those cases that later do develop such ulceration.

In my own series there were 784 cases of uncomplicated ulcers in this situation treated by gastro-enterostomy. The mortality was rather under 2 per cent. and it included a consecutive series of 283 cases without a death. When it is remembered that these are all patients who had been seen by a physician and treated by medical methods it will be realised that in such a series the risk to life from perforation or hæmorrhage, if no operation had been performed, would probably have been considerably higher than this.

A number of the patients in the series who had been watched for not less than five years were carefully investigated for the collective investigation of the British Medical Association [1] and this investigation showed that 84·9 per cent. of them were completely cured. Many of these patients were working men of the hospital class who, owing to the nature of their work, were unable to take any dietetic precautions and yet remained free from all trouble. Of the total group of 784 cases, 26 subsequently developed gastro-jejunal ulcer and this complication necessitated further operation. Six at a rather later date showed the onset of carcinoma. However, in 3 of these the carcinoma only occurred after a long period and at a site remote from the ulcer and therefore were not related either to the ulcer or to the operation. It is true that the condition would have been prevented by a partial gastrectomy, but this is no more reason to advocate that measure than it would be to perform it in normal people as a preventive of subsequent carcinoma.

My own views therefore are that cases of duodenal ulcer should be treated medically in the earlier stages. For the resistant, progressive, or complicated cases gastro-enterostomy is the operation of choice. When so treated about 85 per cent. will be completely cured. The mortality will not be more than 2 per cent., gastro-jejunal ulceration will occur in about 3·3 per cent., and about 0·7 per cent. will later develop carcinoma of the stomach. In none of the cases so treated in my series did a severe anæmia supervene.

Gastrectomy.—Since for the above reasons my own choice is for gastro-enterostomy combined with embedding the ulcer, there are in this series only a few cases treated by partial gastrectomy, the method being advocated only for those patients who showed a very high acidity or where there was some other complication. Of the 20 patients so treated two died, and one developed a gastro-jejunal ulcer, There were no examples of subsequent carcinoma or profuse anæmia. There were also only 15 cases treated by gastro-duodenostomy. But here again a fair comparison cannot be drawn; they were all unusual or complicated cases and the real value of this operation can only be obtained from the figures of those surgeons who use the method frequently, and a discussion of such figures would be out of place in

[1] Brit. Med. Jour. 1928, ii., p. 784.

this communication. Of the 15 cases two died, but in the survivors there were no complications.

LESSER CURVE ULCERS

It is now universally accepted that many such ulcers are cured medically and therefore the results of operation, as discussed here, only apply to those cases where this treatment has been tried, or to cases referred by a physician for surgical treatment. For this lesion there is an increasing tendency to choose partial gastrectomy. This is especially so on the European Continent where practically no other operation is performed and the practice shows some signs of spreading to this country. As already mentioned, even in the hands of the most expert exponents of this operation, the mortality is in the region of 6 to 8 per cent. Moreover it would seem to be theoretically incorrect to remove some three-quarters or seven-eighths of the stomach in order to excise a small chronic ulcer which may be only one or two centimetres in diameter. It is therefore my custom to treat these cases by one of three methods, according to the nature of the ulcer.

Wedge resection, with temporary occlusion of the pylorus and gastro-enterostomy.—All small ulcers in the middle of the lesser curve which are manifestly benign in nature are treated by this method.

The ulcer is excised by a wide wedge after the arteries have been tied, or more rarely destroyed by the cautery. The opening so formed is sutured, the pylorus occluded temporarily with a running silk suture and a gastro-enterostomy performed, the stoma running parallel to the greater curve and so placed that one-half lies proximal and one-half distal to the line of suture of the wound of excision.

In my own series 310 patients were so treated with 13 deaths, a mortality of 4·2 per cent., and in a group which were watched for a minimum of five years there were 88 per cent. complete cures. Of the total, six, two of which were excised by the cautery, developed recurrent ulcers and five showed the later onset of carcinoma. There was one case of severe anæmia following the operation.

Partial gastrectomy.—In some cases where the ulcer is large and adherent to the pancreas or there is much surrounding induration, a wedge resection would necessitate the removal of so large a portion of the stomach that considerable deformity would result.

In this type of lesion and in all those in which there is the slightest suggestion, either in the symptoms or in the appearance at operation, of the presence of early carcinoma a partial gastrectomy should be performed. The drawback of this operation lies in its somewhat higher operative mortality, but in spite of the theoretical objections to the removal of so much healthy stomach, the end-results, with the exception of the relatively small danger of the onset of severe anæmia, are remarkably good.

In my own series there were 240 cases of chronic ulcers so treated with 30 deaths, a mortality of 12·5 per cent. This is considerably higher than many published series, but the method has only been used for the larger and more serious ulcers. There were no examples of recurrent ulceration or of the onset of carcinoma, but four later developed severe anæmia. In the series watched for a minimum of five years 70·2 per cent. were completely cured, the figures being lower than the last series owing to the higher primary mortality.

Gastro-enterostomy.—In some cases the ulcer is so large or is situated so high up on the lesser curve that either a complete gastrectomy would be necessary or the partial gastrectomy would be so extensive and difficult that it would carry with it a high mortality.

In such cases it is my custom to perform a gastro-enterostomy as a palliative operation. Should carcinoma be present the relief will of necessity be only temporary, but even a partial gastrectomy in such conditions would be certain to be followed by recurrence. In about 40 per cent. of the cases a cure will result, while in the remainder the ulcer will persist but usually becomes so much smaller that an excision becomes possible at a later date. Some of the patients are gravely ill, so that even so simple a procedure is associated with a relatively high mortality.

In my own series of 17 cases there were five deaths. There were also five cases in which the ulcer persisted and a second operation was necessary. It may be said then that of all surgical ulcers of the body of the stomach which are treated by methods varying with the nature of the lesion the total mortality will be approximately 7·5 per cent. Some 80 or 85 per cent. will be completely cured, 1·7 per cent. will develop recurrent ulceration, about 1 per cent. will show the onset of profound anæmia at a later date, and less than 1 per cent. will develop subsequent carcinoma.

ULCERATION WITH SEVERE HÆMATEMESIS

The most difficult class of case to treat is that of severe hæmatemesis from peptic ulceration. There is no doubt that many such cases die if treated medically, but on the other hand, they are very bad subjects for surgical interference, even if the operation be preceded by a blood transfusion. As a general rule the diagnosis between hæmorrhage from an acute or chronic ulcer is not difficult, but at times the patient is so seriously ill that an accurate history cannot be obtained, and since hæmorrhage from an acute ulcer usually abates under medical treatment, the decision is one of considerable importance. In actual practice no hard-and-fast rule can be made. To treat all cases of severe hæmorrhage surgically would lead to a high mortality, but if surgical treatment be denied to the patient many lives will be lost. Every case therefore must be regarded as a problem in itself, a problem in which each surgeon may hold opposing views. It thus becomes almost impossible to give a prognosis which in any degree approaches accuracy. The mortality is of necessity high, for only those cases will be selected for operation which it is thought will die if left. The nature of the operation will also vary in the hands of different surgeons. A bleeding duodenal ulcer can nearly always be controlled by embedding the ulcer and completely occluding the duodenum, and then performing a gastro-enterostomy; but for gastric ulcers the operation may consist of exposing the ulcer and ligating the bleeding points, ligating the arteries passing to the ulcer, excising the ulcer or even performing a partial gastrectomy. In my own series there were 50 cases treated surgically and the mortality was between 20 and 25 per cent., but it is impossible to estimate how many of these cases would have died without operation.

PERFORATED ULCERS

Whereas in the last group of cases discussed the surgeon's difficulty lies in coming to a decision whether to operate, in this group there is no such difficulty. In the presence of so grave a disaster practically every patient will die if no operation be undertaken, and therefore it is the surgeon's duty to operate even if only 1 per cent. of the patients can be cured. Fortunately, with the growth of knowledge and a realisation of the importance of early operation the dangers of perforation have been enormously decreased. In my own series, as in every one published, the importance of the time factor is manifest and more credit is due to the practitioner who makes an early diagnosis and insists upon immediate operation than to the surgeon who performs the operation. In cases operated upon within the first twelve hours the

mortality should not be greater than 5 per cent., and the fall in the mortality of the more recently published series is almost wholly due to the inclusion of a larger number of cases treated in this period. Recently published series show a total mortality of not more than 15 per cent. as compared with the 50 per cent. to 60 per cent. of a few years ago. The question as to whether the operation should consist of a simple suture, or whether this step should be combined with a gastro-enterostomy or even whether a partial gastrectomy should be performed, is one which has led to considerable dispute. The surgeon must always keep in mind that his first duty is to save the life of the patient, and the possibility of subsequent trouble becomes of relatively minor importance. If he feels that the patient's condition is quite good, that the perforation has been recent, and that he can perform a gastro-enterostomy in a few minutes, he may be wise to carry out this step at the first operation, but if he is at all dubious he should be content with a simple suture, if necessary combined with drainage; but in such cases the patient must always be carefully watched afterwards and if the ulcer persist a second operation undertaken at a later date.

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SPECIAL ARTICLES

EPIDEMIOLOGICAL SIGNIFICANCE OF THE SEROLOGICAL TYPES OF PNEUMOCOCCI

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THIS paper describes a study of the incidence of the different types of pneumococci in patients and nurses in Knightswood Fever Hospital from April, 1932, to May, 1933. The nursing staff was taken as a selected healthy community, and examinations as to the type of pneumococcus present were made on each nurse at least once a month. The findings recorded are those obtained by repeated examination of 100 healthy adults for varying lengths of time during the 13 months of the investigation, the average period of observation being eight or nine months and the minimum four months. The method employed throughout was the intraperitoneal injection of mice with sputum or mucoid material from the back of the throat, and subsequent typing by means of appropriate antisera. Before proceeding to a discussion on these points it is necessary for the proper appreciation of the significance of changes in the nasopharyngeal pneumococcal flora of the persons examined to include a brief description of the prevalence of acute respiratory diseases in Glasgow and the type of pneumonia admitted to hospital during the period of study. The findings of the investigation are then submitted with reference to, first, the Group IV., then Types I. and II., and lastly, Type III. pneumococci.

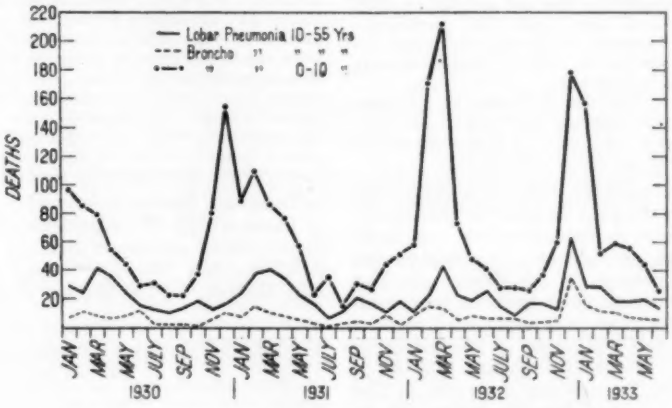


FIG. 1.—Deaths from acute respiratory disease in Glasgow (1930–33).

PREVALENCE OF ACUTE RESPIRATORY DISEASES IN GLASGOW FROM JANUARY, 1930, TO JUNE, 1933

These epidemiological happenings are illustrated in Fig. 1, in which is set forth the deaths notified each month as lobar pneumonia and broncho-pneumonia in the age-period 10–55 years, and also the number of deaths from primary broncho-pneumonia under the age of 10 years. The first two graphs were chosen because of the fact that the age-group 10–55 represents the period of predilection for lobar pneumonia, the corresponding figures on the incidence of deaths from broncho-pneumonia in adults being included for the sake of contrast. The third graph gives the number of deaths notified as acute primary broncho-pneumonia in children which is a much less easily definable class. It is necessary to point out that the course of these different respiratory infections was complicated by an outbreak of influenza which occurred in Glasgow in December, 1932.[1] With regard to the curve of deaths for lobar pneumonia, it will be noted that the disease occurred in periods of high prevalence at regular intervals of approximately 12 months. In the years 1930–32 the highest level was always in the month of March, but the fourth elevation occurred three months earlier than was customary and coincided with the outbreak of influenza in December, 1932. The two periods of high prevalence of lobar pneumonia in 1932 were in the nature of explosive outbreaks, there being a sudden rise to a peak level followed by a more gradual fall. They contrast markedly with the curves of incidence in 1930–31, when there was a broader and more sustained graph. The curve of broncho-pneumonia in adults, apart from a gentle rise each spring, ran a very even course until December, 1932, when it participated in the sudden rise of acute respiratory disease associated with the influenza epidemic. The incidence of deaths notified as acute primary pneumonia in children is of particular interest. In 1930–31 there was no definite association with the curve for lobar pneumonia, but in 1932 there was a complete change, the curve of deaths from acute pneumonia in children corresponding exactly with the two epidemic periods of lobar pneumonia and this prevalence in children being much more intense than the incidence in adults.

TYPE OF PNEUMONIA ADMITTED TO KNIGHTSWOOD HOSPITAL

The present inquiry was begun in the spring of 1932, when the epidemic of lobar pneumonia was in progress, and was continued throughout the period of influenzal prevalence which occurred at the end of the year. As was mentioned above, the influenzal outbreak was accompanied by a high incidence of lobar penumonia,[2] and it is of interest to note that a marked alteration in the types of infecting pneumococci was observed in the cases admitted to hospital at that time.[3] This is illustrated in Table I., which sets forth the frequency and fatality percentages of the cases during the two periods.

TABLE I

A Comparison of the Incidence and Type of Lobar Pneumonia admitted during Two Epidemic Periods of Pneumonia and Influenza Respectively

—	Lobar pneumonia period. Feb.–June, 1932.				Influenza period. Dec., 1932–Jan., 1933.			
	Cases.	Deaths.	Frequency (per cent.).	Fatality (per cent.).	Cases.	Deaths.	Frequency (per cent.).	Fatality (per cent.).
Type I. ..	47	12	42·0	25·5	14	1	23·3	7·1
Type II. ..	41	10	36·6	24·4	32	12	53·3	37·5
Type III. ..	2	2	1·8	100·0	7	3	11·7	42·8
Group IV. ..	22	1	19·6	4·5	7	—	11·7	—
Total ..	112	25	—	22·3	60	16	—	26·7

The Table demonstrates how the incidence of Type I. pneumonia fell from 42 per cent. in the first period to 23·3 per cent. in the second period, with an accompanying diminution in mortality of 18·4 per cent., whereas the incidence of Type II. infections rose from 36·6 to 53·3 per cent. with an increase in death-rate of 13·1 per cent. The Type II. infections during the influenza period were severe at all ages, and the excess of Type II. over Type I. illnesses persisted throughout the first six months of 1933. The frequency percentages for Type III. pneumonia showed a very marked increase which was accounted for by these infections occurring in elderly people already weakened by concurrent influenza.

It might appear then that the outbreak of influenza not only precipitated the seasonal prevalence of lobar pneumonia, but initiated a very marked alteration in the character of the infecting pneumococcal types.

The salient points elucidated may be summarised as follows: (*a*) During the year 1932 lobar pneumonia occurred in epidemic form on two occasions. (*b*) Both these periods of epidemic prevalence were accompanied by corresponding epidemics in children. (*c*) The second epidemic period coincided with an outbreak of influenza in the city, and was associated with a marked alteration in the character of the infecting pneumococcal types. (*d*) In the years 1930–31 a high incidence of lobar pneumonia occurred in the spring months, but epidemic features were not so prominent, and the inter-relationship between the incidence of the disease as it occurred in the adult and in the child not so apparent.

Group IV. Pneumococci

The behaviour of these organisms in the nursing staff during the two epidemic periods is illustrated in Fig. 2, which shows, that along with and following the high incidence of lobar pneumonia in the spring of 1932, there was a correspondingly high percentage of Group IV. pneumococci. This incidence of Group IV. organisms tended to follow the case incidence of lobar pneumonia. There was a fall in the Group IV. curve from 71 per cent. in April to 27 per cent. in August, after which the carrier-rate gradually rose to 38 per cent. for December. In January the curve fell to 31·5 per cent., but rose to a peak of 48 per cent. in March, dropping to 36 per cent. in April. The incidence of the Group IV. organisms thus showed a considerable degree of fluctuation, a feature which is not in accordance with the findings of some other observers. Rosenau, Felton, and Atwater [4] recovered pneumococci from samples of the community in proportions around 90 per cent., with only a moderate degree of variation. Cruickshank [5] also found the percentage of pneumococci in the throats of inmates of a mental institution to be constantly between 92 and 100 per cent. On the other hand, the report [6] on a study of the nasopharyngeal bacterial flora of a group of the Manchester population, over the period July, 1925, to September, 1927, states that "the fluctuations in the pneumococcal carrier-rate were curious and unexpected."

The incidence of the Group IV. organisms in the 100 nurses comprising the selected healthy community showed a marked difference in the results obtained by one exmination of each person as compared with those obtained by repeated examinations, a fact which is brought out in Table II.

TABLE II

Incidence of Pneumococci in 100 Healthy Persons

Types of pneumococci isolated.	Results obtained by—	
	Single examinations.	Repeated examinations.
Group IV.	40	85
Type III.	9 (55 per cent.)	17
Type II.	4 (55 per cent.)	15
Type I.	2 (55 per cent.)	8
Nil	45	15

It will be seen that the percentage of pneumococci isolated by a single examination of each person was 55, Group IV. organisms accounting for 40 per cent., but by means of repeated examinations Group IV. organisms were recovered from as many as 85 per cent. of the series. The occurrence of Group IV. organisms in individual nurses showed that persistence of the organism in any one person was not a common feature. In a minority of cases the organisms were recovered on successive examinations over a period of five to eight months, but generally the carrier state was markedly intermittent in character.

To obtain further information as to the significance of these Group IV. organisms, 36 strains were typed by means of antipneumococcal sera for Types IV.–XXXII., the antisera being kindly supplied by Miss Cooper,[7] of the Bureau of Laboratories, Department of Health, New York. The proportion of Group IV. strains classified by means of the additional antisera is contrasted with a further series isolated from (1) adult convalescents in pneumonia pavilions and (2) adults and children suffering from acute pneumonia, the results being set forth in Table III.

TABLE III

Proportion of Group IV. Strains Typed by Antisera IV.–XXXII.

Source of strains.	Examined.	Strains that typed.	Strains that remained unclassified.
Healthy persons ..	36	17	19
Adult convalescents ..	36	20	16
Acute pneumonia ..	28	16	12
Total	100	53	47

It will be seen that by means of these additional antisera 53 per cent. of the series were further classified. In all 18 different types were isolated and the incidence of these is demonstrated in Table IV.

TABLE IV

Incidence of 53 Group IV. Strains Classified by Antisera IV.–XXXII.

Type of pneumococcus.	Number typed.	Type of pneumococcus.	Number typed.
IV.	6	XV.	1
V.	2	XVI.	2
VI.	10	XVII.	1
VIII.	5	XVIII.	1
IX.	2	XX.	4
XI.	2	XXI.	6
XII.	3	XXV.	1
XIII.	2	XXXVIII.	2
XIV.	3	XXX.	1

Apart from the Type VI. pneumococcus the different types were uniformly distributed. A Type VI. pneumococcus was isolated on ten occasions, six occurring in infants with acute broncho-pneumonia, three in adult convalescents, and one in an adult with broncho-pneumonia.

Some interesting points were noted in dealing with these strains. The degree of significance to be attached to the recovery of Type VI. pneumococcus from the throat was variable. In a child with acute pneumonia a Type VI. strain and a pneumococcus unclassified by sera IV.–XXXII. were isolated from the throat on two separate examinations during the acute phase of the illness. Two weeks later the child developed an empyema, from the pus of which Type I. pneumococci were obtained. On the other hand, in a fatal broncho-pneumonia in a child of two and a half years with mild conjunctivitis and otorrhœa, Type VI. organisms were isolated not only from the throat but also from the conjunctival and aural discharges. It is probable that in the first case the organisms appeared as temporary parasites, and that in the second they were the real cause of the illness. A noteworthy finding was recorded in a child of six months. At the onset of an acute broncho-pneumonia a Type XIV. pneumococcus was isolated. Ten days later, when the illness was at its height, a second examination was made with the result that well-marked agglutination occurred with every type antiserum from I.–XXXII. One other feature was the tendency for neighbouring types to be isolated at one time; Types XXVIII. and XXX., Types XIII. and XIV., and Types XX. and XXI. being isolated from individuals living in close association. Regarding the unclassified strains, 12 were isolated from cases of acute pneumonia, of which 6 were lobar and 6 broncho-pneumonic in character. The remaining 35 were recovered from convalescents and healthy persons.

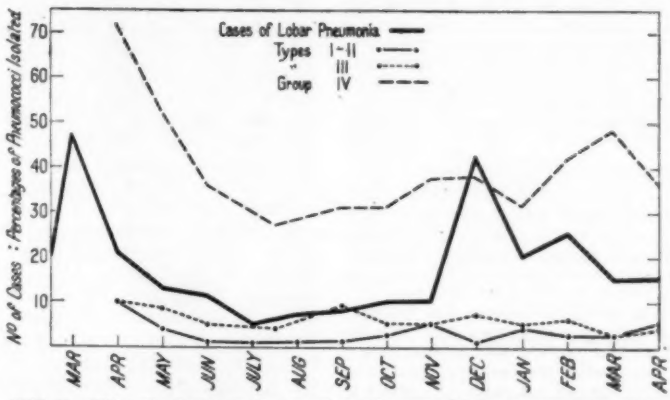


FIG. 2.—This chart shows the number of cases of lobar pneumonia (thick black line) in Knightswood Hospital from March, 1932, to May, 1933; and also the percentage of nurses harbouring pneumococci of various types during the same period.

Types I. and II. Pneumococci

From Fig. 2 it will be observed that the carrier-rate of Types I. and II. pneumococci in the nursing staff was as high as 10 per cent. in April, 1932, following the first epidemic period, but remained continuously between 1 and 5 per cent. throughout the rest of the investigation. The distribution of these organisms is illustrated in Table V., in which is presented a comparison of the pneumococcal flora in the throats of 60 nurses during their period of training in pneumonia pavilions; with that obtained from a control series consisting of 75 nurses who had not previously served in these wards.

TABLE V

Incidence of Pneumococci in the Throats of 60 Nurses in Pneumonia Pavilions and 75 in Control Wards (April, 1932, to May, 1933)

Types of pneumococci.	Pneumonia wards.		Control wards.	
	Positive.	Per cent.	Positive.	Per cent.
I. ..	8	13·3	—	—
II. ..	13	21·7	2	2·7
III. ..	7	11·7	11	14·7
IV. ..	53	88·3	59	78·8

The figures were obtained by means of repeated examinations, and they clearly demonstrate how, with two exceptions, the incidence of the Types I. and II. pneumococci was confined to nurses serving in pneumonia wards.

In these wards 21 nurses proved to be carriers of Types I. and III. pneumococci at one time or other, whereas, in the control series, there were only two Type II. carriers who were stationed in diphtheria and scarlet fever pavilions respectively. During the first half of the study there was an equal number of Types I. and II. carriers, but in the second portion when a preponderance of Type II. infections occurred there was an increased proportion of Type II. carriers. Two nurses proved to be persistent carriers of these organisms for periods of three and five months respectively, but otherwise the carrier state was short-lived.

The feature of these results is that the case of lobar pneumonia is the source of spread of the two chief pathogenic types and that nurses in attendance on such cases are liable to become carriers of these organisms, usually for a short space of time, but without any apparent danger to themselves or to others. The significance of this is increased by the fact that a similar incidence of Types I. and II. pneumococci was found among patients in pneumonia wards admitted with conditions other than Type I. or II. pneumonia, and it is evident then that in this particular pneumonia pavilion there was a continuous frequency of Types I. and II. pneumococci for a period of at least one year; and that a not inconsiderable number of patients admitted with conditions other than pneumonia together with the nurses on duty in these wards were exposed to this high concentration

of Types I. and II. pneumococci, and yet in no instance did any of these persons develop a pneumonia due to these types.

Type III. Pneumococci

The behaviour of the Type III. pneumococcus as a nasopharyngeal parasite in the community is of peculiar interest. Avery and others [8] in 1917 recorded the percentage of Type III. pneumococci among normal persons in New York to be as high as 28 per cent., but in this country the incidence has usually been estimated between 5 and 10 per cent. In the present study, however, as a result of repeated examinations the Type III. pneumococcus was recovered from 17 per cent. of the normal persons examined, a percentage which is more in keeping with the American figures. Furthermore, it was found that once established in the nasopharynx the Type III. pneumococcus showed a greater tendency to persist than did the organisms of Types I., II., or Group IV. This is demonstrated in Table VI. in which is set forth the incidence of these organisms in 11 Type III. carriers upon whom repeated examinations were made for at least five months after the detection of the carrier state.

TABLE VI

Illustrating Degree of Persistence of Type III. Pneumococcus in 11 Normal Persons

Carriers.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
A ..	III.	III.	III.	..	III.	III.	III.	III.	III.	III.	..	..	..
B ..	III.	III.	—	..	IV.	III.	IV.	III.	III.	III.	III.	III.	III.
C ..	III.	—	IV.	..	III.	III.	—	IV.	III.	III.	—	—	—
D ..	III.	—	—	..	III.	—	III.	IV.	IV.	IV.	IV.	—	—
E ..	III.	—	—	..	..	III.	III.	II.	—	IV.	—	—	..
F ..	IV.	IV.	—	IV.	III.	IV.	—	—	—	—	—	—	III.
G ..	..	..	..	III.	III.	III.	III.	—	III.	—	IV.	IV.	IV.
H ..	..	..	..	..	..	..	..	..	III.	IV.	III.	—	IV.
I ..	—	III.	..	—	—	IV.	IV.	..	..	..	..	..	..
J ..	IV.	IV.	III.	..	—	—	—	—	IV.	IV.	..	..	..
K ..	..	..	..	..	..	..	..	III.	IV.	—	IV.	..	..

The Table shows that six nurses were fairly constant carriers of the Type III. pneumococcus for periods varying from 6 to 13 months. Carrier A proved to be a true persistent carrier in as much as the organism was isolated on every examination over a period of ten months. In Carrier B the organisms showed considerable intermittency during the first seven months of the inquiry, but were constantly recovered during the last six, while in Carrier F the Type III. pneumococcus was isolated in August, a Group IV. organism in September, and no other pneumococci were recovered until April, when the Type III. organism again appeared.

Summary

A study of the epidemiological characters of acute primary pneumonia in adults showed that the highest prevalence usually occurred in the spring months. In the selected healthy community under observation it was noted that the highest incidence of Group IV. pneumococci also occurred at that time of the year. In 1932 the occurrence of lobar pneumonia in epidemic form was more marked than in the years immediately preceding and was intimately associated with the incidence of acute primary pneumonia in children, to such an extent that it appeared that on each occasion the prevalence of lobar pneumonia was merely an incident in a respiratory epidemic. It is possible that the occurrence of influenza in the city provoked the second outbreak of lobar pneumonia, and it might seem as if epidemic outbreaks of the disease could coincide with the usual rise in the incidence of Group IV. pneumococci in the nasopharyngeal passages of the community, or develop suddenly by reason of some powerful exciting influence, as in this instance by the widespread occurrence of influenza. Furthermore, it would also seem more in accordance with the epidemiological evidence that the Types I. and II. organisms develop autogenously from the parasitic Group IV. pneumococci which normally inhabit the nasopharyngeal passages.

Although the case of lobar pneumonia was demonstrated to be a fertile source for the dissemination of the Type I. or II. pneumococci to healthy persons, yet a direct spread of infection seldom occurred and the carrier state was therefore regarded as a normal and generally harmless sequel, of little consequence from a public health standpoint. The Group IV. pneumococci were the dominant organisms in the community, but their incidence was subject to marked degrees of fluctuation, and in gauging their significance the employment of antisera for Types IV.–XXXII. was a most valuable aid. Regarding the Type III. pneumococcus it would appear as if it were really essentially saprophytic in character. It occurred as a persistent parasite in 17 per cent. of the persons examined, and its incidence appeared to bear no relation either to the individual case of pneumonia or to the general prevalence of the disease.

Conclusions

(1) Acute pneumonia due to pneumococci Types I. and II. is a disease which usually has its highest prevalence in the spring of the year. (2) In periods of epidemic prevalence there is, as a rule, evidence of increased activity among the Group IV. pneumococci. (3) The development of Types I. and II. pneumococci is autogenous in the vast majority of cases. (4) The Types I. and II. pneumococci seldom promote the spread of the disease by direct contact. (5) When responsible for a case of acute pneumonia, however, they readily spread to persons in contact and produce the carrier state. (6) Secondary contact carriers are infrequent. (7) Group IV. organisms are common organisms in the community. Their incidence is not constant but subject to a marked degree of fluctuation. (8) The use of Group IV. antisera for Types IV.–XXXII. is of considerable value in determining whether any one type is more prevalent or more fatal. (9) The Type III. pneumococcus is primarily saprophytic in character and in the present inquiry was recovered from 17 per cent. of the normal persons examined.

I desire gratefully to thank Dr. William Dow, medical superintendent of Knightswood Hospital, who afforded me every available facility and encouragement.

REFERENCES

1. Macgregor, A. S. M.: Public Health, 1933, xlvi., 117.
2. ,, ,, : Brit. Med. Jour., 1933, i., 278.
3. Christie, I. M.: THE LANCET, 1932, ii., 1173; 1933, i., 469.
4. Rosenau, M. J., Felton, L. D., and Atwater, R. M.: Amer. Jour. Hyg., 1926, vi., 463 and 570.
5. Cruickshank, R.: THE LANCET, 1933, i., 563, 621, and 680.
6. Ministry of Health Rep. on Pub. Health and Med. Subjects, No. 58, London, 1930.
7. Cooper, G., Rosenstein, C., Walter, A., and Peizer, L.: Jour. Exper. Med., 1932, iv., 531.
8. Avery, O. T., Chickering, H. T., Cole, R., and Dochez, A. R.: monographs Rockefeller Inst., No. 7, 1917.

SOUTHALL-NORWOOD HOSPITAL.—Lord Wakefield recently laid the foundation-stone of this new hospital in West Middlesex, and gave a cheque for £1100 to complete the £10,200, which the building will cost. The institution, which will have 20 beds, will serve a population of 40,000. The equipment will cost a further £2000.

COMPENSATION FOR OCCUPATIONAL DISEASES

INTERNATIONAL ACTION

In 1925 the International Labour Conference adopted a Convention providing for compensation for occupational diseases, the important proviso of which is that it shall be on the same basis as in national laws for accidents. A schedule of a few occupational diseases is a part of this Convention. The schedule is a very short one because great difficulty was experienced in arriving at agreement in regard to the basic principle of the Convention, and it was deemed wise to restrict the number of diseases inscribed on the schedule.

However, this conference passed a recommendation to the effect that its governing body should instruct the International Labour Office to continue its studies with a view to subsequent revision of the Convention by additions to the schedule. In the nine years which have elapsed since the adoption of the 1925 Convention the matter has been studied by the International Labour Office and its correspondence committee on hygiene, and the present conference had before it a proposal for a considerable extension of the schedule. In the first place the conference had to decide whether the partial revision of the Convention of 1925 was to be dealt with in toto at the present conference or whether the so-called "two reading" procedure should be followed. In this latter case, after discussing the general outline of the Convention, a questionnaire is prepared which is sent to the Member States for reply, and a final decision in regard to the Convention is taken at the following session. In this instance it would have been 1935. However, in spite of considerable opposition the conference decided to deal with the revision of the Convention in one reading.

The matter was then referred in accordance with the rules of procedure to a committee which, after sitting for over a week, recommended the extension of the schedule by the addition of the following occupational diseases:

Silicosis, with or without pulmonary tuberculosis; phosphorus poisoning; arsenic poisoning; poisoning by benzene, its homologues, and their nitro- and amido-derivatives; poisoning by the halogen derivatives of hydrocarbons of the aliphatic series; pathological manifestations due to radium, radio-active substances, and X rays; and primary epithelioma of the skin arising out of handling tar, pitch, and similar substances.

The principal difficulty in dealing with the draft Convention centred on the inscription of silicosis, and particularly on whether compensation should be paid for silicosis when tuberculosis coexists. A number of medical men, acting as expert advisers to certain national employers' associations, were on the committee, and these strongly urged the view that it is difficult to separate during life for assessment purposes the incapacity caused by silicosis from that caused by associated conditions, especially tuberculosis. It was stated that at least in Holland no tuberculosis was ever observed in association with silicosis, and on the other hand it was stated that certain forms of tuberculosis without any silicosis produced the same signs and symptoms as silicosis with tuberculosis. Various difficulties arising out of legal enactments in certain countries were also adduced in favour of providing compensation for silicosis only and not for the total incapacity arising out of silicosis with tuberculosis. Difficulties of administration in countries which allow the certification for compensation of incapacity or death by any registered practitioner were also urged against the inscription of silicosis, as it was considered—no doubt correctly—that the diagnosing of this condition can only be carried out satisfactorily by experts. However, in the end the committee adopted by a very large majority the following formula of inscription:

Silicosis with or without pulmonary tuberculosis, provided that silicosis is an essential factor in causing the resultant incapacity or death.

The revision of the Convention as proposed by the committee was adopted by the conference by 78 votes against 8.

The committee also submitted to the conference for transmission to the governing body a series of five resolutions, the first four of which referred to silicosis. These resolutions can be briefly summarised as follows:

The states ratifying this Convention are recommended:

1. To establish a list of trades and industries in which there is a risk of contracting silicosis, giving due regard to the progress of scientific and clinical investigations into the ætiology of the disease.
2. To give attention to prophylactic measures, especially to the prevention of dust and the importance of preliminary and periodical examination of employees subjected to exposure to silica dust.
3. To entrust the diagnosis and certification of silicosis to medical men specially qualified for this work with facilities for adequate radiological examination, and to organise some suitable method of coördinating experiences concerning the carrying out of medical, radiological, and pathological examinations as well as the results of scientific investigations.
4. To institute special investigations regarding the incidence of silicosis and tuberculosis in the coal-mining industry.

The fifth resolution recommends the governing body to consider the inscription on the agenda of the 1935 conference the consideration of adding to the schedule ankylostomiasis, carbon disulphide poisoning, and such other occupational diseases as may be considered advisable.

MEDICINE AND THE LAW

Charge of Criminal Abortion: Effect of Previous Acquittal

William Maxwell, a herbalist, has given his name to a leading case in English criminal law. He was convicted at York assizes last February on two counts of an indictment charging him with (1) manslaughter of a woman whom he was treating as one of his patients, and (2) using upon her an instrument with intent to procure miscarriage. He was found guilty and was sentenced to 20 months' imprisonment. In criminal cases the English law shows special anxiety that the evidence laid before a jury shall be limited to the particular issue which it has to try. Except in specified exceptional circumstances the jurors must not be told that the accused has done (or is suspected of having done) the same thing before. Such information might persuade them into thinking that on that account he is likely to have been guilty in the case before them now. The more natural it would be for jurors to be so persuaded, the more assiduously does the law seek to exclude the risk of persuasion. Maxwell had not been previously convicted of criminal abortion or of any other crime. But he was tried seven years ago at Leeds for the manslaughter of a woman patient and

was acquitted. This fact was brought out, as will presently be explained, at the trial at York. What effect would it have on a jury's mind? What effect ought acquittal to have on anyone's mind? These were the issues which the recent judgment in R. *v.* Maxwell had to decide. The jury at York last February was allowed by the trial judge to hear of the previous acquittal and to convict Maxwell. The Court of Criminal Appeal refused to interfere. The case was referred to the House of Lords by a rare exercise of the Attorney-General's power to certify a point of criminal law as of exceptional public importance. The House of Lords upset the conviction and ordered Maxwell's release.

THE FACTS AND THE STATUTORY POSITION

There is no need to elaborate the facts disclosed at Maxwell's trial. It was his case that, at the time of the seizure and collapse which immediately preceded his patient's death, he was in another room; he said he had not touched her on this occasion. The Lord Chancellor observed that the evidence against Maxwell at York was undeniably strong and some very damaging admissions had been made. These considerations, of course, made it more essential to give him all proper protection from injustice. The mention of the previous trial and acquittal in 1927 "might have been the last ounce which turned the scale against him."

The cross-examination of an accused person is governed by the Criminal Evidence Act, 1898, which enabled all accused persons to be witnesses in their own behalf. They received specific protection but there were certain conditions in which the protection might be forfeited. In the application of the Act to Maxwell's case the material words are those which enact that an accused person, giving evidence as a witness, "shall not be asked . . . any question tending to show that he has committed or been convicted of or been charged with any offence other than that wherewith he is then charged, or is of bad character, *unless* . . . he has given evidence of his own good character." At York the defence seems to have almost unnecessarily drawn attention to what had happened at Leeds. A witness for the Crown was cross-examined as follows: "Is it a fact within your own knowledge that a patient whom he was treating some years ago died during the treatment?" The answer was "Yes." Counsel for the prosecution then claimed the right to clear the matter up by asking "What happened to William Maxwell upon the death of his patient?" The judge disallowed the question in that form, but eventually the point arose again when Maxwell entered the witness-box. He told his counsel that he had had large numbers of women patients. "Have you ever been convicted of any offence in your life?" "No, I have lived a good, clean, moral life." This certainly amounted to "giving evidence of his own good character" within the meaning of the Criminal Evidence Act. It would have entitled the Crown to cross-examine Maxwell about his previous convictions but Maxwell had no previous convictions. The Crown elicited from him the fact of the previous trial and acquittal at Leeds in 1927, and the case proceeded with the result already stated. The Crown could argue that, by giving evidence of his own good character, Maxwell had thrown his statutory shield away and had exposed himself to a question whether, in the words of the Act, he had "been charged" with another offence. The Crown contended that, after the questions asked by the defence had elicited half the story, it was proper that the jury should hear the whole story.

LORD SANKEY ON THE EFFECT OF ACQUITTALS

The House of Lords answered these arguments by declaring that an acquittal nullifies a charge. Nobody would ever be able to clear his character if the fact that a prima facie charge had once been made against him were always to endure as a slur upon his reputation. The prosecution must not say that a man who has been acquitted can still remain under a cloud. If someone is charged before a magistrate and the prosecutor immediately admits that he has made a mistake, there is no slur; such an idea was "contrary to the whole idea of English jurisprudence." The mere fact of a charge "cannot in general be evidence of bad character or be regarded as other than a misfortune." The acquittal at Leeds in 1927 did not go to show that Maxwell must be guilty at York in 1934, or that Maxwell was an untrustworthy witness; it was therefore a quite irrelevant fact. Apart from the Criminal Evidence Act, irrelevant matters must be excluded because, if allowed, they were likely to lead the minds of the jury astray into false issues. Lord Sankey's judgment in R. *v.* Maxwell is a reminder that legal standards of probability are different from ordinary standards. The ordinary man, if selecting a confidential clerk or a domestic servant from a group of candidates, would probably avoid choosing one who had been previously convicted of dishonesty or who had even been suspected of dishonesty. In a court of law this consideration or prejudice must be rigidly excluded.

VITAMIN STANDARDISATION

SECOND INTERNATIONAL CONFERENCE

THIS conference, convened by the Health Section of the League of Nations, met on June 12th at the London School of Hygiene and Tropical Medicine. The personnel was almost the same as on the first conference in 1931, including Profs. Steenbock, von Euler, Poulssen, Jansen, Fridericia and Drummond, and Madame Randoin; new faces were those of Prof. Szent-Györgyi from Hungary, Dr. Nelson from U.S.A., and Prof. de Mattei from Italy. The absence of the German delegates was much regretted. The conference met under the chairmanship of Dr. E. Mellanby, F.R.S., and Miss Harriette Chick, D.Sc., and Dr. W. R. Aykroyd were, as before, the secretaries.

Sir GEORGE BUCHANAN, as a member of the Permanent Standards Commission, opened the conference and Sir HENRY DALE, F.R.S., representing the same body, followed with some words of general advice, applicable to all biological standards as well as to vitamins. He urged the conference to confine its official deliberations to the definition of standards and units and to avoid discussing methods of biological testing, which were the concern of the individual worker and did not demand international coöperation. Finally he begged the delegates, when they left the conference to return home, to give their fullest consideration to the actual means of implementing the decisions which they had just taken, for there existed no international machinery for imposing the use of the standards and units upon the governments, scientific workers, or industrial concerns of the various countries. Sir Henry Dale made the suggestion, in this connexion, that all those possessing editorial influence with any journal should bring pressure to bear on the editorial boards to refuse papers dealing with vitamins in which units other than international units are used.

The conference spent a part of its three days' life in plenary session, but for the larger part of the time it was broken up into four committees, each

dealing with one of the vitamins A, C, D, and B_1, for which standards and units had already been set up in 1931. The work of the delegates was to consider how the standards and units which they had then established had worked in practice, and what changes ought to be made in response to the very considerable body of knowledge which had accumulated in the intervening three years. The reports on the working of the standards revealed few complaints, the only important one being connected with the use of crystalline carotene as the standard for vitamin A; workers complained that it offered difficulties in the actual mechanical handling. The advance of knowledge, however, revealed a number of points at which improvement might be made. Three of the vitamins, A, C, and D, had progressed into being more or less well-defined crystalline bodies, and the day was even dimly in sight where a biological test might be abandoned altogether, and a measurement of a chemical reaction or of a physical constant might take its place.

The actual decisions of the conference are best considered under the heads of the individual vitamins. The recommendations are embodied in a report which awaits the confirmation of the Permanent Commission on Biological Standardisation. The Permanent Commission meets later in the summer, and after its meeting the report will be published.

Vitamin A.—Knowledge of the chemistry of carotene has so progressed that pure β-carotene, of m.p. 184° C. (corr.) and optically inactive, was able to be recommended in place of the impure carotene, provisionally adopted before. The unit previously adopted was the biological activity of 1 γ of the standard carotene; β-carotene possesses greater biological activity than the old standard, and the amount of β-carotene which would provide a unit of the same size, that is to say, which possesses the same biological activity as 1 γ of the old standard, was fixed at 0·6 γ. Much work has been put into ascertaining a suitable solvent for administering the carotene to rats; in coconut oil, fulfilling certain tests, so satisfactory a solvent has been found that it was possible to recommend the distribution of the new β-carotene standard in solution, thereby obviating the difficulties encountered by workers in handling the crystalline material. A well-tried sample of cod-liver oil, whose potency in international units has been well established, was recommended for adoption as a subsidiary standard. Finally, a spectrophotometric test, measuring the coefficient of absorption at 328 mμ, was regarded in certain strictly defined circumstances as being a satisfactory measurement for vitamin A in liver oils and concentrates. A figure is given relating this measurement to the biological activity and thus, within a narrow sphere, the use of a biological test is eliminated.

Vitamin B_1.—The adsorbate on acid clay, previously adopted, has been found most satisfactory in practice; its further adoption was therefore recommended, together with the maintenance of the unit as then defined.

Vitamin C, like vitamin A, has progressed into the realm of pure substances; the lemon juice previously adopted as standard was therefore abandoned and pure *l*-ascorbic acid, as defined by a number of physical constants, was recommended in its stead. The unit was retained and 0·05 mg. of *l*-ascorbic acid was accepted as the equivalent in biological potency of 0·1 c.cm. of fresh lemon juice, whose biological activity was previously used as the unit.

Vitamin D.—The old standard material of irradiated ergosterol in olive oil solution was considered by all to have behaved well and there is still a large quantity of it available. It was not considered that there was any advantage to be gained at present by attempting to substitute crystalline vitamin D for it, but provision was made for such an ultimate change, when it should appear desirable. One very awkward set of facts, however, came to light in considering the standard for vitamin D. Research has recently been accumulating results which indicate that all animals do not utilise all antirachitic materials in the same relative proportion. Cod-liver oil, for instance, is much more potent as an antirachitic, relative to irradiated ergosterol, when it is tested on chicks than it is when tested on rats. Thus if a biological test of cod-liver oil as compared with the international standard irradiated ergosterol is made with chicks as the test animal, a much larger number of units of vitamin D will be attributed to the cod-liver oil than would be the case if the same comparison were made with rats. It is possible that other animals, pigs and man, are again different, and it is impossible, in the present imperfect state of knowledge, to avoid the major heresy in biological standardisation of defining the animal used for the test. Though it proved impracticable to obviate this difficulty completely, there is little doubt that further research will once more make generalisation possible.

Other vitamins.—The possibility of setting up pure lactoflavine as a standard for vitamin B_2 was canvassed, but it was generally felt that it would be premature to do so and that there were no practical arguments for haste, since deficiency of vitamin B_2 was not yet definitely linked up with any recognised syndrome of disease in man.

The conference was evidently a triumph of international coöperation; it created an atmosphere where only true facts could survive and where no element of individual or national self-interest crept in to mask the truth. In those circumstances an agreed set of recommendations was easily produced in the brief space of three days.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

DISCUSSIONS ON HEALTH INSURANCE

In spite of official opposition on the part of the American Medical Association to any form of national health insurance, a certain ferment of inquiry is at work in many parts of the country. Less than a year ago (July 12th, 1933) a committee on survey of medical services and health agencies reported to the House of Delegates of the Michigan State Medical Society recommending the adoption of the principle of health insurance. The House of Delegates was not ready to accept this recommendation, but in January last sent Dr. Henry A. Luce, speaker of the House, and Dr. Nathan Sinai, chairman of the committee, to England to make a further study of the English system. These observers have made their report and the Michigan doctors are now committed to the principle of health insurance provided that its administration is under the control of the medical profession. A detailed plan will be submitted to the House of Delegates when it reassembles in the autumn. It is probable that this plan will provide for an administrative board of governors made up of three physicians, one dentist, one pharmacist, one nurse, one hospital superintendent, two representatives of industry, and two representatives of the general public. The politicians are not invited to participate. Fear of corruption through political control has been one of the main forces operating against health insurance in this country. The voluntarily insured family will be guaranteed free choice of physician.

In the meantime the West Coast has provided many private experiments in health insurance, some respectable, others not. In the State of Washington a large proportion of the medical profession is engaged in organised contract practice, and there is a feeling that a system of compulsory health

insurance will be the outcome of the present trend. In California the majority of the profession is opposed to health insurance, but there is an important minority with many lay sympathisers. At the 1934 meeting of the California State Medical Association a State-wide plan for providing hospital service in return for periodic payments failed to secure a necessary two-thirds majority. Dr. Rodney, spokesman for the opposition, is an ardent advocate of compulsory health insurance. It was, as you have already noted,[1] in the lively atmosphere of California that Mr. John Kingsbury, co-author with Sir Arthur Newsholme of "Red Medicine," and director of the Milbank Memorial Fund, recently launched his proposal for meeting the present problem of the costs of medical care.

The basic problem, says Mr. Kingsbury, is this: the costs of medical care are incurred in a haphazard, uncertain, and unbudgetable way. And the underlying cause is the fee-for-service purchase of medical service. He agrees with Sir Arthur Newsholme that the health of every individual is a social concern and responsibility, and that medical care in its widest sense for every individual is an essential condition of maximum efficiency and happiness in a civilised community. After discussing the history of insurance in Europe and in America Mr. Kingsbury comes to "tentative conclusions" based upon the incomplete report of Dr. I. S. Falk and Mr. Edgar Sydenstricker and upon his own studies. An insurance plan should not aim primarily to furnish financial assistance to the poor, but to enable all who cannot afford to pay for adequate medical service as individuals to purchase it as groups. The plan should therefore care for all who have incomes up to $3000 or even $5000. However, the plan must include the very poor who are slow to come into a voluntary system. Insurance should therefore be compulsory. European experience shows clearly that schemes which are voluntary at first eventually become compulsory. Cash benefits should not be included in a health insurance scheme. The cost of adequate service is estimated at $36 per person annually. This includes specialist and nursing care, dental care, in-patient treatment when needed, drugs, and medicine; also institutional care for mental disease and tuberculosis. Medical services of the kinds which are ordinarily purchased privately would cost about $27 per person. Administrative control is given to the laity for financial and executive problems, and to the profession for control of professional problems. Mr. Kingsbury holds that European systems of insurance have never dealt adequately with preventive care. Provision in his scheme is made for periodic medical examinations, immunisations, prenatal and postnatal care. The present is a favourable opportunity for the consideration of all these matters in California, as the State Senate have just appointed a committee to investigate the high costs of sickness.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE IRISH MEDICAL ASSOCIATION

THE annual meeting of the Irish Medical Association was held in the Royal College of Surgeons, Dublin, on June 26th, under the presidency of Dr. Robert J. Rowlette. For the first time in its history the programme of the meeting included a scientific session. Two discussions had been arranged—on the modern treatment of pulmonary tuberculosis, and the relations of the medical officer of health and the general profession. Dr. E. T. Freeman gave a careful account of the gold treatment of pulmonary tuberculosis and of the parts that the various surgical procedures—artificial pneumothorax, phrenicectomy, thoracoplasty—play in treatment. He was followed by Dr. J. T. Daniel, tuberculosis officer of the city of Dublin, who gave a survey of the present-day lines of treatment, without confining himself to the newer methods. He stressed the important place in treatment that must be taken by rest, fresh air, diet, and hygienic surroundings and habits of life. Others who took part in the discussion were Dr. John Shanley, Dr. J. C. Flood, Dr. A. J. d'Abreu, and the president. Dr. J. A. Harbison, medical officer of health for County Dublin, opened the second discussion, and surveyed the respective spheres of action of the medical officers of health and the general practitioners. He was followed by two other county medical officers of health, Dr. J. A. Musgrave, of Louth, and Dr. T. J. R. Maguire, of Roscommon, and by Dr. T. P. McDonnell and Dr. T. F. Armstrong, who spoke from the point of view of the general practitioner.

In the afternoon the business session of the Association was held. Dr. Rowlette and Mr. H. F. MacAuley were declared re-elected as president and vice-president respectively, and the names of those elected to the council were read out. The annual report states that the membership during the year 1933 had increased from 339 to 365. Six members had died, 14 had resigned, and 27 had been removed from the list for non-payment of subscriptions; 73 new members had been elected. During the year a joint council with the Irish committee of the British Medical Committee had been formed—the General Council of Medical Associations—and this body was authorised by the Irish Medical Committee to act for the profession as its executive in representations to Government departments. The finances of the Association were satisfactory. Dr. Thomas Gillman Moorhead was elected an honorary member of the Association.

An account of conversations between the B.M.A. and the Irish Medical Association with a view to amalgamation as far as members resident in the Irish Free State were concerned was given by Mr. MacAuley, vice-president. The meeting expressed its approval of the steps that had been taken and authorised the continuance of conversations on the same lines.

In the evening the members dined together and entertained a number of guests at the Dolphin Hotel. No annual dinner had been held since 1914. The guests included Mr. Sean T. O'Kelly, vice-president of the Executive Council of the Irish Free State and Minister for Local Government and Public Health; the Lord Mayor of Dublin; the Attorney-General; Dr. Moorhead, president of the B.M.A.; and Mr. Doran, chairman of the Irish Hospitals Commission.

KING'S PROFESSOR OF THE PRACTICE OF MEDICINE

The President and Fellows of the Royal College of Physicians of Ireland have elected Dr. Victor Millington Synge to the King's professorship of the practice of medicine in the School of Physic in Ireland, Trinity College, Dublin, vacant by the death of Dr. F. C. Purser. Dr. Synge has been for several years one of the visiting physicians to the Royal City of Dublin Hospital. It will be remembered that Dr. Purser had only held the office two months when his sudden death occurred.

[1] THE LANCET, April 28th, p. 904.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

WORK FOR THE DEAF AND BLIND

THE Scottish Association for the Deaf have opened a boot-repairing factory in Glasgow, which is the first of its kind in Scotland. The factory is equipped with modern plant, and an instructor foreman has been appointed. There is accommodation for about 24 workers, most of whom will be deaf. Sir Robert Wilson, chairman of the association, in opening the factory, spoke of the difficulty in obtaining positions for the deaf when they left school, as employers feared that their handicap might increase the number of accidents. Dr. James Kerr Love, vice-president, said that during the last 40 years the percentage of acquired deafness among school-children had been reduced by half, which he attributed to better attention in hospitals and the work that was being done among school-children. He believed that at present the powers of the local authorities were not being fully used.

At the recent Aberdeen conference the capacity of the blind to learn salesmanship was discussed. It was admitted that though successful selling schemes for disposing of the work of the blind have been organised by all the societies of Scotland, most of the centres could give instances of blind people who had failed to earn their own living as salesmen. It was thought this was probably due to lack of enterprise and proper training. Modern business methods should be made available to the blind by means of braille price tabs and receipt slips and so forth. In spite of differences of opinion as to how far it was practicable to teach the blind salesmanship it was felt that the idea should be systematically tried. The blind tea-merchant has long been a familiar figure in Scotland, and though the sale of other merchandise —notably their own handiwork—is more complicated, a strong interest in the possibilities of this type of work for the blind was shown at the conference.

SHEFFIELD RADIUM CENTRE

DEPARTMENT FOR DEEP X RAY THERAPY

THIS department, which has been in use for some months, was to have been opened by the Duke of York on July 5th, but the engagement had to be cancelled on his doctors' orders. The apparatus for high voltage X ray therapy has been especially designed and incorporates the latest advances. It is, moreover, so designed that if the X ray tube suffers from a broken or worn out filament, or if the anode requires adjustment, the tube can be taken to pieces and put together again with little trouble and at very small cost, and routine work can be resumed within an hour or two. The Greinacher high tension circuit has one end earthed and supplies two tubes at 200 kv. and 10 m.a. each. The current is rectified by continuously evacuated valves and then smoothed by condensers. The group of research workers of Metropolitan Vickers, the makers of the apparatus, described its advantages in the February issue of the *British Journal of Radiology*.

The necessary vacuum in both the X ray tubes and the continuously evacuated rectifiers is maintained by means of oil diffusion pumps, in action during all the time when the apparatus is in use, and the tube is sealed by the apposition of surfaces ground optically flat to within one or two wave-lengths of light. The anticathode in each tube is hollow and the surface emitting X rays is of gold. Inside the hollow anticathode water is circulated from the mains for cooling.

From the medical point of view we understand that the apparatus has so far been very satisfactory. The movements of the tube are similar to the well-known Holfelder Cannon. The whole tubes can move bodily up or down and the X ray beam can be used in any direction with the exception of an angle of 30 degrees which is blind because the water-cooling tubes cross the path of the beam. One tube has already been used for some 2000 hours and the routine work has been in progress all the time with only a few minor interruptions. The actual time of emission of X rays has been about 1000 hours. The number of patients treated (mostly by fractionation techniques) was 160 by the end of January—i.e., after three months' work. In addition, many hours have been spent in making physical measurements.

The apparatus is controlled by a staff nurse with no previous radiological training and all fields are arranged by a medical officer.

BRITISH HEALTH RESORTS ASSOCIATION

NORFOLK COAST CONFERENCE

THE conference which took place on June 30th was the first to be held on the East coast.

Dr. BURTON-FANNING (Norwich) presided at the morning session at Sheringham, and a summary of the aims and objects of the association was given by its founder, Lieut.-Colonel R. H. Elliot.

Dr. R. A. YOUNG (London) then opened a discussion on

THE SEASIDE RESORT IN THE TREATMENT OF RESPIRATORY DISEASES

by quoting the words of Dr. Ellsworth Huntington (U.S.A.): "The climate found on the shores of the North Sea is the best in the world for human health and activity." Great Britain, Dr. Young continued, offered health resorts suitable, if chosen with discretion, for practically all the ills to which her islanders were subject. It was essential, however, if we were to make the best of our resources, that the indications and contra-indications of each resort and any seasonal limitations it might have should be better understood; nor must the effect of environment be ignored.

The coast and hinterland of Norfolk was rich in all the factors, climatic and environmental, that tend to stimulate, and its effect in those cases of respiratory disease which were capable of reaction to stimulating influences was almost magical.

Dr. L. S. T. BURRELL (London) stressed the importance of putting the individuality of the patient even before the nature of his malady in selecting the health resort. The factor of peculiar value from the point of view of health in the English climate was its variability. Only in rare cases—where the mental make-up of the patient was such as to be impressed by foreign surroundings—had he ever known greater improvement to occur abroad than at one of the health resorts at home.

Dr. ANDREW MORLAND (Mundesley Sanatorium) said that the dryness and freedom from fog of the East coast, together with the absence of extremes of summer heat or winter cold, made it an ideal all-the-year-round resort for the convalescent from acute respiratory disease. For those whose nutritive powers were inefficient some protection was necessary during the colder winter months. For this and other reasons he advocated sanatorium treatment for the consumptive. Though in its stimulating character the

climate of the coast was comparable with that in the Alps, it had not the disadvantage of increasing depth and rate of respiration and of pulse-rate that were sometimes associated with high altitudes. Moreover, the important question of diet was much more satisfactorily arranged at home where plenty of fresh milk and vegetables were available. There was a certain robust type of consumptive, capable of rapid reaction, whose progress could be expedited by wintering in Switzerland, but the large majority made just as good if not better progress at sanatoria at home. Dr. Morland illustrated his thesis by graphs, one showing that the mortality rate from phthisis was appreciably less in countries bordering on the North Sea than elsewhere on the continent, and another that the gain in weight showed less seasonable variation in England than abroad. As regards seekers after health in general, Dr. Morland considered that one of the chief factors inducing people to go abroad was the irritating restrictions of D.O.R.A. at home resorts.

Dr. VALENTINE BLAKE (Great Yarmouth), president of the Norfolk and Norwich Medico-Chirurgical Society, presided at the afternoon session held at Cromer.

Climatic Factors in Treatment

Dr. FORTESCUE FOX (London) opened a discussion on "Climatic and allied factors in the incidence and treatment of disease, with special reference to the coast of East Anglia." He said that the invigorating climate of the coast, due to a remarkable combination of warm sunshine and cool air-currents, was in his opinion a great national asset. Too little attention had been paid in the past to the study of climate, and he pleaded for systematised observation and the collection of data by medical men practising in the coastal resorts, so that the matter could be placed on a more scientific basis.

Dr. S. H. LONG (Norwich) referred to the Norfolk and Norwich Hospital's convalescent home at Cromer, and said that over a period of 25 years the rapidity and degree of improvement of the patients sent to the coast had been remarkable; the home was in constant use except for a period of six weeks in the winter.

Dr. W. J. PEARSON (London) also stressed the immediate nature of the response shown by the debilitated to the tonic effects of the Norfolk climate. While it was true that in adults certain diseases either in themselves called for sedative treatment or resulted in so much pathological change as to render their victims incapable of reaction, this was rarely if ever the case in children. It followed that if the coast was too stimulating for adults in some circumstances, for children no better climate could be found.

Mr. L. C. W. BONACINA, F.R.Met.S., said there was a great deal of public misconception about the coast, particularly as regards its winter climate, owing to the false association of East coast with East winds. The Norfolk coast got no larger share of East winds than the country generally, for they blew with equal frequency elsewhere; neither was the direction of the wind the deciding factor in its pleasantness or the reverse. The temperature of a wind approaching England from the continent of Europe might be raised ten degrees by its passage across the Channel or the North Sea. On the contrary, a south-west wind reaching the East coast across a snowclad England might be distinctly colder. Taking the year round, wind, sunshine and vapour-pressure—the climatic factors that mattered most for health—were ideally blended on the coast of Norfolk.

Among the other speakers in the morning or afternoon were Sir Holburt Waring, Prof. Langdon Brown, Sir Stanley Woodwark, Drs. Leonard Findlay, Howard Humphris, M. B. Ray and J. B. Alexander, of London, and a number of Norfolk practitioners. The discussions were remarkable for their frankness and unanimity, especially regarding the contra-indications of the coast. As might be expected, these are illnesses of a type which at home would be treated on sedative lines, such as borderline mental cases, asthmatics of the type in whom the predominant factor is probably nervous, sufferers from migraine and epilepsy, those with hyperarterial tension, and elderly bronchitics with cardiac failure.

The members of the conference were received by the vice-chairman of the Cromer Urban District Council on the evening of their arrival, and entertained at dinner on Saturday evening, when Lord Meston was the principal guest. They were also entertained by the Sheringham Urban District Council to luncheon on Saturday, while Sunday was devoted to motor excursions along the coast.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Rear Admiral R. W. B. Hall, C.B., O.B.E., has taken up his duties as Director-General of the Medical Department of the Navy in succession to Sir Reginald St. G. S. Bond, K.C.B.

The following appointments have been notified:—

Surg. Comdr. A. W. Gunn to *Sussex* on recommg.

Surg. Lts. J. G. Slimon to *Vernon*; D. D. Steele-Perkins to *Gnat*; A. D. Hepburn to *Victory*, for R.N.B.; S. H. R. Price to *Victory* for R.N.B., Portsmouth, and to Exeter; H. E. B. Curjel to *Drake* for R.N.B., Devonport; H. A. Clarke to *Victory* for R.N.B., Portsmouth; and F. H. Ward to *Sussex* on recommg.

Surg. Lt. (Short Service) C. D. D. de Labilliere transferred to Permanent List.

ROYAL ARMY MEDICAL CORPS.

Capt. D. K. Weston relinquishes his commn.

Short service commission.—The undermentioned to be Lts. on Prob.: W. M. E. Anderson, H. B. Wright, J. Boyle, R. H. Foster, J. S. Ruddell, A. G. D. Whyte (from R.A.M.C., T.A., Supern, for serv. with the O.T.C.), A. L. Pennefather, C. G. O'Driscoll, D. T. Swift, F. E. Buckland, A. MacLennan, J. H. J. Crosse, J. Morgan, R. A. Stephen, E. H. P. Lassen, R. S. Vine, I. Buchanan, J. E. Jameson, M. W. Allen, W. T. Bermingham, and K. H. Clark.

The undermentioned Lts. on prob. are secd.: A. G. D. Whyte, C. G. O'Driscoll, A. MacLennan, J. Morgan, R. A. Stephen, K. H. Clark, and M. J. Horgan.

ARMY RESERVE OF OFFICERS

C. M. Fraser to be Lt.

TERRITORIAL ARMY

Capt. A. H. G. Down resigns his commn.

Lts. L. F. Richmond and N. H. Leslie to be Capts.

D. S. Anderson (late Offr. Cadet, St. Andrews Univ. Contgt., Sen. Div., O.T.C.) and A. D. Forgie to be Lts.

The King has conferred the Efficiency Decoration upon Maj. R. J. Bruce.

TERRITORIAL ARMY RESERVE OF OFFICERS

Lt.-Col. and Bt.-Col. J. W. Keay, Lt.-Col. J. H. Stephen and Maj. J. A. Morris, having attained the age limit retire and retain their rank, with permission to wear the prescribed uniform.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: B. Z. Shah, V. R. Mirajkar, A. J. D'Souza, B. C. Ashton, M. M. Khan, E. R. Daboo, and B. G. Mallya.

Capts. to be Majs.: F. R. W. K. Allen, M. Taylor, and W. Lawie.

Temp Lts. to be temp Capts.: S. S. Ahluwalia, M. Singh, and P. Papatla.

It is announced that Surgeon Rear-Admiral R. W. B. Hall and Surgeon Rear-Admiral W. W. Keir have been appointed Honorary Physician and Honorary Surgeon respectively to the King.

PANEL AND CONTRACT PRACTICE

AN OPENING FOR INJUSTICE

CONSIDERING how easy it is for a patient, or relative of a patient, to bring a charge against an insurance practitioner—involving, perhaps, professional honour, or even veracity—the exact means by which justice is administered are of no little importance.

It is obviously fair and right that any adult patient should be able to send a complaint to the clerk of the insurance committee (which is responsible for the administration of medical benefit) if he thinks that his doctor has done something he ought not to have done, or left undone something that he ought to have done. The procedure in this case is for the clerk to forward relevant extracts from the letter of complaint, or possibly the whole letter, to the practitioner concerned and to ask for his observations. These observations, or extracts from them, are sent to the insured person, whose further comment is invited. If this in turn contains anything which is thought to be important for the practitioner to know it is forwarded to him. The whole correspondence, verbatim, is then circulated to the members of the medical service subcommittee. (This consists of an equal number of lay persons who represent approved societies or insured persons and of medical men who represent the panel committee and the local medical committee—which in these days often have the same personnel. There is an independent chairman usually appointed from the neutral members of the insurance committee—i.e., from those representing the county council or the Ministry of Health.) The medical service subcommittee decides whether a hearing is necessary and, if so, arranges the time and place. Finally, having heard the case, it decides whether there has been a breach of the regulations; whether, if so, there should be a caution or censure; and whether money ought to be withheld from the practitioner's remuneration, and, if so, how much. Its decision is usually confirmed by the full insurance committee, but must also be confirmed by the Ministry of Health. Either party can appeal to the Ministry when the case is reheard de novo.

There is little to complain of in this procedure, for the members of the committee are not likely to know anything about the complainant or the doctor personally and justice can be correspondingly impartial.

It sometimes happens that the insured person does not want to make a complaint, but a relative does. If on the correspondence it appears to the medical service subcommittee that the complaint is one that ought to be investigated in spite of the insured person's refusal to complain, they have the power to advise either the medical benefit subcommittee or the main committee that this is a matter which requires investigation. Thereupon a resolution is passed by one of these committees "that the matter be referred to the medical service subcommittee for investigation." This procedure is called "getting a reference." The insurance committee (or its medical benefit subcommittee) is becoming the complainant, before one of its own statutory subcommittees, against a particular practitioner.

In these circumstances it may easily happen that some of the lay members of the medical service subcommittee—those representing either insured persons or approved societies—were present at the meeting at which the reference was passed. This hardly appears fair from the point of view of administration of justice, for a complainant can hardly act with equity as accuser and judge. On the other hand, the practitioner may rely upon the support of his professional brothers, for these are not likely to have been involved in getting the reference. The position is reversed, however, under Article 32 (2) of the Medical Benefit Consolidation Regulations, 1928, which not only gives a panel committee power to send a case to the insurance committee for investigation, but also provides that the insurance committee must in this case investigate. The only tribunal for this investigation is the medical service subcommittee, and this includes several members of the panel committee, all of whom have been steeped in the details which have resulted in the panel committee deciding for a reference. What confidence will the practitioner have in the impartiality of his tribunal when his professional brothers on it belong to the body which has instituted the proceedings against him; and what hope is there of the laymen on that tribunal supporting him against the advice (as he will think) of their professional colleagues—who now represent his accusers?

The particulars of a recent case have been published for all and sundry to know. Dr. A. made a complaint to the London panel committee that Dr. B. had tried to secure the transfer of insured persons to his list. The case was heard in the usual way by the attendance of both doctors before the ethical subcommittee, where Dr. A. submitted six signed statements from patients all alleging persuasion by Dr. B. to join his panel. Dr. B. tried to refute the allegations, but there was no opportunity of examining the people who wrote the letters, since they were not present. At the subcommittee meeting, nevertheless, the allegation was held to be proved. The subcommittee took a serious view of the case and decided to ask the full panel committee to take proceedings under clause 44 of the Medical Benefit Regulations, whereby they are empowered to make representations to the Minister that the continuance on the medical list of the practitioner would be prejudicial to the efficiency of the service. When this request came before the full committee it was said quite plainly that if the case was one of canvassing the General Medical Council should deal with it. If it was only a question of removal from the panel then the proper action was to refer it to the medical service subcommittee. The point here is that there was so much discussion of the case that no one present could fail to be impressed with the opinion of Dr. B. which had been formed by the subcommittee.

Solicitors were instructed to take steps to carry out the committee's resolution and to begin proceedings with a view to the removal of the practitioner's name from the medical list. The solicitors, however, at once realised the difficulty and reported their opinion that unless the committee got further and stronger evidence their case would be unsuccessful. The subcommittee thereupon instructed them to proceed with the collection of further evidence. The solicitors did so; and their comments on the statements obtained from six witnesses were as follows: (A) and (B) were vague and would not stand up to the cross-examination. (C) Actually asked to be transferred. (D) A good witness, but would not have written had he known that there would have been any trouble; therefore doubtful strength. (E) Doctor against whom complaint was made was specially sent for and there was no mistake.

(F) This patient was told the doctor he wanted to see was Dr. A. In view of this report the subcommittee decided *not* to try to get Dr. B. removed from the panel; but as in the course of the investigations it had been discovered that he gave some of these insured persons who are not on his list medicine by prescription on the official form and on one occasion a certificate without seeing the patient, it asked the panel committee to refer the case to the medical service subcommittee for investigation. This will require the consent of the Minister of Health, for it is technically out of time owing to the delay involved in the investigation by the panel committee. The panel committee passed the reference, so that, subject to the Minister's consent, it now goes to the insurance committee. If the Minister does give consent then three of the seven men who will have to hear this case will have been familiar with the details of the complaint from its commencement, and if they are the normal medical members of that subcommittee one of them was actually present at the original inquiry whilst another in his capacity of chairman of the main committee cannot fail to have all the details of the case at his fingers' ends.

There is obviously something wrong in the administration of justice to insurance practitioners as instanced in this case. The decision of the ethical subcommittee that this man was guilty of canvassing, for which the panel committee must accept full responsibility, was based on evidence which was proved insufficient. The panel committee's decision to make representations to the Minister with a view to the withdrawal of the practitioner's name from the medical list, had therefore to be rescinded. Instead of then letting the matter drop, the panel committee decided to put this doctor on trial again on a minor charge before a tribunal in which its own members have to adjudicate and decide the penalty, if any.

The function of the panel committee (through its ethical subcommittee) should be to try and effect a friendly settlement between two doctors who are in dispute. When evidence is given that something quite serious has occurred the matter should be referred, without details being published, to the proper tribunal for the hearing of such cases, either the General Medical Council or the Ministry of Health or the medical service subcommittee. No officers of the committee (since they are ex-officio members of all subcommittees), and no members of the ethical committee should be eligible to sit as medical members of the medical service subcommittee. The ethical subcommittee has no statutory power to call evidence, it cannot pay the out-of-pocket expenses of witnesses, and by its size also it is quite unsuitable to deal with this sort of case. It appears to have been overlooked in the regulations under which the panel committee can refer cases to the medical service subcommittee for trial that its own members sit upon that subcommittee and may have taken part (as in the present case) in adjudicating upon the case previously. This seems to be a more glaring anomaly than the former method of reference by the insurance committee to its own subcommittee.

One way of getting over the reference difficulty would be to send the case to another medical service subcommittee, where, of course, no one would have had any previous details that might possibly prejudice their minds. It is clear that under the present procedure the administration of justice to an insurance practitioner may not be conducted in the proper atmosphere of impartiality.

CORRESPONDENCE

BRITISH HEALTH RESORTS ASSOCIATION

To the Editor of THE LANCET

SIR,—We have been much encouraged of late by the increasing interest shown in the work of the British Health Resorts Association by the medical profession. Our association is largely medical, not only in personnel but in its objects, which are to awaken and sustain interest in the health side of our British resorts. At our recent conferences at Harrogate and Cromer we were supported by leaders of the profession, and I venture to think that the quality of the discussions was something of which we may be proud.

Though we look in the main for financial support to the local authorities of the places we are trying to help, we are very anxious to secure more of it from the medical profession, particularly from those members practising in the health resorts or who take a special interest in climatology, balneology, and physical medicine. The recent action of the Harrogate Medical Society and the Torquay division of the B.M.A. has therefore given our council great pleasure. These bodies have circularised their members with a view to enlisting their interest in our work, and by this means we have secured a considerable number of new members. Our medical advisory committee would be glad to have an opportunity in your columns of bringing these examples to the notice of similar bodies, in the hope that they may do likewise.

Our subscription is £1 1*s.* a year, though we would welcome any donations, small or large. We cannot offer any direct material advantage to subscribers, but we believe there are many who would be willing to show a practical interest in a movement which has a distinctly medical as well as a patriotic aim. I shall be glad to answer any inquiries.

I am, Sir, yours faithfully,

ALFRED COX,
General Secretary.

199, Piccadilly, W., July 2nd.

JOINT LUBRICATION

To the Editor of THE LANCET

SIR,—In your last issue Dr. Shirley Jones has called attention to the importance of the viscosity of synovial fluid in relation to joint lubrication, and has inferred that certain forms of arthritis may be due to alterations in the mucin content of this fluid. Very little is known about the physiology of the mucoproteins, but it does seem fairly clear that the thyroid gland is concerned. Thus in myxœdema there is a generalised accumulation in the tissues of a colloid which is, or closely resembles, a mucoprotein, and it is also known that the secretion of the parotid gland in this disease assumes an abnormally mucoid character. Since this plethora of mucoprotein is readily corrected by thyroxine it might be anticipated that the opposite condition of hyperthyroidism would be accompanied by a paucity of mucin in the tissues, and if the synovial fluids share in these general changes, then arthritis, from defective lubrication, should be commonly encountered in Graves's disease. It is rather suggestive that S. Duncan (Jour. Amer. Med. Assoc., 1932, xcix, 1239) and others regard polyarthritis

as a common complication of this disease. My argument is somewhat weakened by the fact that joint troubles are not uncommon in myxœdema. However, cartilage is very prone to undergo mucoid degeneration and perhaps the arthopathy of myxœdema may be due to degenerative softening of articular cartilage.

I am well aware of the perils of drawing conclusions from circumstantial evidence, and I am not rash enough to suggest that the thyroid plays more than a small part in the pathogenesis of arthritis as a whole. But it seems to me that direct measurements of the effect of thyroxine on the viscosity and mucin content of synovial fluid might yield useful information. I am, Sir, yours faithfully,

F. B. BYROM.

London Hospital, July 3rd.

HOOKWORM IN GOLD-MINES

To the Editor of THE LANCET

SIR,—In the current issue of THE LANCET there is a leader on Hookworm in Gold-mines, based on a paper by J. H. Hodgman, to which I am, somewhat reluctantly, bound to refer.

I have been intimately concerned with the hookworm problem on the mines referred to, and have no knowledge of a "J. H. Hodgman" ever taking an important part in this work. Presumably, therefore, he writes from second-hand knowledge, and, like most knowledge so acquired, his information is decidedly inaccurate. Within the scope of a letter it is impossible to deal with the matter fully, and I will therefore draw attention only to outstanding errors :—

(1) In 20 years' work on the gold-mines I have never seen cockroaches in any notable numbers underground.

(2) Although it was suggested that viable ova may pass through rats, repeated experiments with rats caught underground failed to confirm the suggestion.

(3) It is true that about 40 per cent. of *East Coast* natives arrive on the mines infected with hookworms, but these constitute less than *one-third* of the present labour force. Among the remaining two-thirds infection is rare.

(4) The infection rate *decreases* with residence on the mines, although no mass treatment is undertaken.

(5) It is the grossest possible exaggeration to describe the latrine conditions as appalling. I say this on the ground of personal knowledge which is as wide and intimate as anyone's could be.

I am, Sir, yours faithfully,

A. J. ORENSTEIN,
Chief Medical Officer, Central Mining. Rand Mines.

Weymouth-street, W., June 30th.

LECTURES AND PAMPHLETS ON MENTAL HYGIENE

To the Editor of THE LANCET

SIR,—I have just finished reading the challenging article of Dr. Edward Mapother in your issue of May 26th, and am astounded at his concluding sentence.

As to the giving of collective counsel upon details of mental hygiene directly to the public by lectures and pamphlets (as opposed to urging resort to expert advice), in view of all the possibilities of misunderstanding and misapplication, it seems to me likely that on the whole this will do more harm than good.

Earlier in the lecture Dr. Mapother writes (regarding sex experience and sex education) :

"The first general prophylactics needed are the steady growth of a morality that is rational rather than traditional, honesty among adults, and proper education of the child."

If lectures and pamphlets do more harm than good how does he propose to apply, for example, the above excellent prophylactics? Does he condemn all pamphlets? Specifically, would he condemn this booklet issued by the U.S. Children's Bureau : "Are you training your child to be happy"? Or does he really mean that there are some pamphlets and some lecturers that do more harm than good? One can easily agree to that. Indeed, how else has our traditional morality been popularised?

I am, Sir, yours faithfully,

Santa Va., N.M., June 17th. ROSSLYN EARP.

PUBLIC HEALTH

The Infectious Stranger

IT is the duty of local authorities to provide hospital treatment for the infectious diseases of inhabitants of their own area, but apparently they have no such legal obligation as regards visitors who normally live elsewhere. Similarly, they are not obliged to arrange or pay for the care of those of their own residents who develop infectious diseases while staying in some other district. Thus no one is really responsible for patients who are unwise enough to fall ill while absent from their own locality, and, as one might expect, there have been cases in which a good deal of trouble has arisen from authorities disclaiming responsibility and sending infectious patients back to the reluctant care of the bodies under whose auspices they ordinarily dwell. It is to obviate any further disputes of this kind that the Minister of Health has now issued the Public Health (Treatment of Infectious Diseases) Regulations, 1934. In an accompanying memorandum it is pointed out that the primary public purpose of the hospital treatment of infectious disease is to prevent the spread of infection, and as the population exposed to the risk is the population of the area in which the disease is discovered, "it is generally recognised that the proper course is for the authority of that district . . . to provide the necessary treatment." To send people back to their homes when they clearly require hospital care is detrimental to public health both by delaying treatment and risking dissemination. The regulations accordingly provide that authorities shall have the same powers and duties (in relation to the provisions of hospitals, &c.) in respect of strangers as in respect of their own inhabitants. This will not, of course, affect the right of an authority to decide on the advice of its medical officer what cases shall be treated in hospital, but it is intended to secure that the decision shall be based on medical considerations alone, with a view to the most effective control of the disease and the best use of the accommodation available.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 23RD, 1934

Notifications.—The following cases of infectious disease were notified during the week : Small-pox, 2 (last week 3) ; scarlet fever, 2363 ; diphtheria, 1123 ; enteric fever, 17 ; acute pneumonia (primary or

influenzal), 836; puerperal fever, 43; puerperal pyrexia, 118; cerebro-spinal fever, 20; acute polio-myelitis, 6; acute polio-encephalitis, 3; encephalitis lethargica, 6; dysentery, 14; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 2nd–3rd was as follows: Small-pox, 3 under treatment, 1 under observation (last week 5 and 0 respectively); scarlet fever, 1615; diphtheria, 1588; measles, 1331 (last week 1547); whooping-cough, 282; puerperal fever, 25 mothers (plus 8 babies); encephalitis lethargica, 268; poliomyelitis, 2; "other diseases," 208. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there were no deaths from small-pox or enteric fever, 23 (5) from measles, 6 (1) from scarlet fever, 33 (3) from whooping-cough, 30 (9) from diphtheria, 27 (8) from diarrhœa and enteritis under two years, and 24 (5) from influenza. The figures in parentheses are those for London itself.

Four of the deaths from measles were in Gateshead and 3 in Sheffield. Four fatal cases of whooping-cough were reported from Liverpool. There were 7 deaths from diphtheria in Leeds and 3 in Liverpool. Influenza was given as the cause of 4 deaths in Manchester, and 4 of the fatal cases of diarrhœa and enteritis were in Birmingham.

The number of stillbirths registered during the week was 260 (corresponding to a rate of 40 per 1000 total births), including 37 in London.

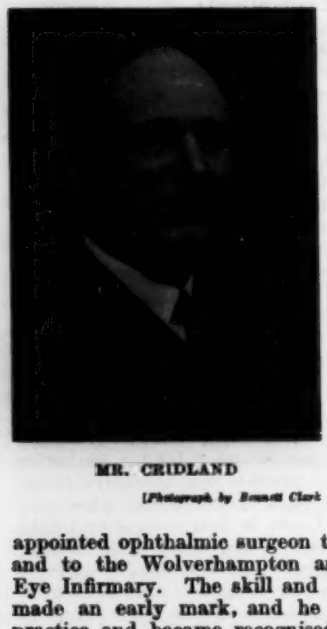
OBITUARY

ARTHUR BERNARD CRIDLAND, F.R.C.S. Edin.

CONSULTING OPHTHALMIC SURGEON, ROYAL HOSPITAL, WOLVERHAMPTON

WE regret to announce the death of Mr. Bernard Cridland, which occurred on June 29th at Salisbury House, Wolverhampton.

Arthur Bernard Cridland was born in Bristol and educated at Clifton College and University College, London, proceeding for his medical training to St. Mary's Hospital. He took the English double diploma in 1898 and proceeded a few years later to the F.R.C.S. Edin., and at the beginning of his career manifested the direction which his professional activities would follow, becoming at once house surgeon to the Bristol Eye Hospital and, later, anæsthetist with charge of the ophthalmic wards at the Royal Infirmary, Bristol. He then commenced his long association with Wolverhampton, where he was appointed ophthalmic surgeon to the Royal Hospital and to the Wolverhampton and Midland Counties Eye Infirmary. The skill and assiduity of his work made an early mark, and he soon gained a large practice and became recognised as an authority on the effects and treatment of injuries of the eye as observed in a large industrial town. He was mainly instrumental in bringing the tonometer into regular use in England. His special qualities were much aided by the fact that he was a thoroughly sound all-round surgeon. He now made a position in the ophthalmological world through his association with the fruitful labours carried on at Oxford, and testified to by the success of the annual ophthalmological Congress in that city. This association commenced in 1910, when he took the D.O. Oxford diploma, and in 1914, in succession to the late Sydney Stephenson, he became secretary to the Congress. The duties in connexion with this post he discharged for 14 years, and it is generally admitted that the importance and popularity of these annual meetings is mainly due to Cridland's effective and continuous work, discharged with a certain charming personal care. He was Master of the Congress from 1929 to 1931, and in 1933 delivered the Doyne Memorial Lecture in which he summarised his valuable investigations on the aftermath of cases of intra-ocular foreign body. This was a practical piece of work, and will be found in full in the Transactions of the Ophthalmological Society (vol. liii., 1933). The chances of restored ocular function in these cases, which so often have tragic issue, were well summarised, and the conclusions based upon a vast number of recorded accidents. It happens, most pathetically, that in the series of articles entitled "Prognosis" now running in our columns, one of the next to appear will be from Cridland, the subject being the outlook for patients suffering from perforating injuries of the eyeball, a subject which he may be said to have made his own. As was inevitable, Cridland became deeply interested in welfare work for the blind; he was the British representative on the Council of the National Association for the Prevention of Blindness, and the mitigation of distress among our blind population was always near his heart. He was this year senior vice-president of the Ophthalmological Society of the United Kingdom and would have succeeded to the chair in due course, and he was also vice-president of the Council of British Ophthalmologists and honorary member of the French Ophthalmological Society. By no means a profuse writer, what came from his pen was always a record of practical experience, and his papers will be found for the most part in the *British Journal of Ophthalmology*.



MR. CRIDLAND

[Photograph by Bassett Clark

Bernard Cridland will be equally regretted by all his fellow workers and scientific colleagues and by a large circle of patients and friends. He was a golfer, a motorist, and a fisherman, while his wide connexion with his professional specialty was due largely to his work at the Oxford Ophthalmological Congress, whose meetings displayed his fine personal qualities. "That Congress," writes one of his friends, "brought out all that was great and lovable in the man. It was a pet child of his and he spared neither time nor energy in promoting its welfare and success. He acted as secretary to the Congress for many years, and no more perfect secretary could have been found; genial, friendly to all, he never seemed to forget a name or a face. He was never harassed and never fussed. He was most ambitious for the high standard of the Congress, and it is mainly due to his devotion that it has reached its present position. It is tragic that his death should have occurred on the eve of its meeting."

WILLIAM ARTHUR VALENTINE, M.D. Dub.

THE death is announced at Appledore, North Devon, of Dr. William Valentine, one of the best known practitioners in his district. He was born in County Fermanagh 65 years ago, and received his medical education at the University of Dublin. He graduated in arts and took the M.B., B.Ch. degrees in 1891, and three years later proceeded to the M.D. He settled in practice at Appledore in 1898, and in due course came to hold many public posts. He was district medical officer for the Northam district, M.O.H. to the Barnstaple port sanitary authority, surgeon agent to the Admiralty, medical inspector of seamen for the port of Bideford, and surgeon to the Bideford and District Hospital.

As quite a young man Dr. Valentine had been interested in the volunteer movement; he became M.O. to his territorial battalion, and on the outbreak of war proceeded with a division of the Devonshire Regiment to India. Later he served in France with the Royal Fusiliers, and in the closing phase of hostilities he was attached to the Serbian Army in Salonica. He came in for a warm tribute as a soldier-doctor in a book by Major Cecil Alport, recently reviewed in these columns, and entitled "The Lighter Side of the War." He is spoken of there, in reference to his work at Salonica, as "just the sort of officer we required, especially as he had already seen service in France. He was well over age . . . he joined us and spent the last two years in the Near East doing very excellent work indeed . . . a good man and a stout fellow this." For his services in Salonica Valentine received the Serbian Order of St. Sava, and was appointed a Knight of the Redeemer of Greece. He always cherished the greatest affection for the 1/6th Battalion of the Devonshire Regiment, at whose annual reunion in Barnstaple he was a highly popular figure. He was a prominent member of the British Medical Association, acting as chairman of the North Devon Division and as a member of the representative body, while he was nominated last year as president-elect of the S.W. branch, but was unable through failing health to take up election, which occurred just before his death.

Dr. Valentine was keenly interested in lifeboat work at Appledore. He was also an experienced yachtsman, having been vice-commodore of the Taw and Torridge Sailing Club. His wife predeceased him, but he leaves two sons, one of whom succeeds to the medical practice in Appledore.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Royal Assent

IN the House of Lords on Thursday, June 28th, the Royal Assent was given to a number of Acts, including the Unemployment Act, the Mines (Working Facilities) Act, and the London County Council (General Powers) Act.

Bills Advanced

In the House of Commons on June 28th the Road Traffic Bill passed through Committee and was considered on Report. On the following day (Friday, June 29th) the Bill was read the third time. On Thursday, June 28th, the South Devon and East Cornwall Hospital, Plymouth, Royal Hospital, Devonport and Central Hospital, Plymouth (Amalgamation, &c.), Bill was read the third time.

HOUSE OF COMMONS

THURSDAY, JUNE 21ST

Poor-law Relief in Scotland

Mr. KIRKWOOD asked the Secretary of State for Scotland the total number of persons in Scotland on able-bodied and poor relief as at May, 1934, compared with May, 1933; and what was responsible for the abnormal increase.—Sir GODFREY COLLINS replied: The number of persons, excluding dependents, in receipt of ordinary poor relief in Scotland at May 15th in the years 1933 and 1934 were 90,959 and 98,193, respectively, an increase of 7·9 per cent. The corresponding figures for persons in receipt of able-bodied relief were 43,348 and 72,338 respectively, an increase of 66·8 per cent. With regard to the latter part of the question, the hon. Member will see that there have been increases in both cases. As regards the ordinary poor, the cause of the increase would appear mainly to be the cumulative effect of the long continued industrial depression in exhausting resources available for the support in working-class families of non-able-bodied members of the family. With regard to the much greater increase of the able-bodied who are receiving relief, I am informed that 91 per cent. of this increase has occurred in Glasgow and Greenock where the rates of relief were recently increased, involving the addition to the poor roll of persons whose unemployment insurance benefit and transitional payments are being supplemented.

WEDNESDAY, JUNE 27TH

Diphtheria Immunisation

Mr. GROVES asked the Minister of Health (1) what was the child population of Dagenham at the following ages: up to 5, 6 to 10, 11 to 15; how many Dagenham children at each of these age-periods had received three injections of the diphtheria immunising mixture in each of the years 1931, 1932, and 1933; how many of these were subsequently Schick tested; and how many of those Schick tested were found negative as a result of the test; and (2) how many cases of diphtheria were notified in Dagenham in the year 1931.—Sir HILTON YOUNG replied: The child population of the Dagenham urban district at the ages referred to by the hon. Member was, at the census of 1931, (1) up to 5—15,954; (2) 6 to 10—15,503; (3) 11 to 15—8559. As regards the remainder of the question, the following is the information furnished by the local authority. The figures for immunisation and testing for any year may not strictly correspond as children immunised in any year are not necessarily Schick tested in the same year.

Age-period.	Children who received three injections of immunising mixture.			Children Schick tested after immunisation.			Children found negative on Schick testing.		
	1931	1932	1933	1931	1932	1933	1931	1932	1933
Under 6 years..	499	234	193	—	253	88	—	194	85
6 to 10 ..	480	300	163	—	402	160	—	305	145
11 to 15 ..	190	102	70	—	171	50	—	132	34

The number of cases of diphtheria notified in the urban district in the year 1931 was 207.

Mr. GROVES asked the Minister of Health whether he was aware that, in a speech to sanitary inspectors, the deputy medical officer of health for Leeds admitted that 8 per cent. of the children inoculated by him with toxoid, with a view to preventing diphtheria, had suffered very

severe reactions; and whether he would request medical officers of health who were responsible for the introduction of this system to report to him all such serious results of the inoculations, together with information regarding the material used.—Sir HILTON YOUNG replied: I am advised that the remarks to which the hon. Member refers related only to the use of powerful forms of diphtheria prophylactic employed to induce rapid immunisation. The speaker, therefore, stressed the importance of applying a preliminary test which would discover the possibly severe reactors, and of immunising these by the ordinary routine method. In the circumstances, the action suggested in the last part of the question does not appear to be called for.

Inoculation and Parents' Consent

Mr. GROVES asked the Minister of Health whether he would advise all medical officers of health to ensure, when arranging schemes for any form of inoculation of school-children or children attending clinics, that no child be inoculated without the written consent of its parent or guardian.—Sir HILTON YOUNG replied: Advice of this kind has always been given in the official memoranda issued by my Department on this subject, and I have no reason to suppose that it is not generally followed.

THURSDAY, JUNE 28TH

Miners' Nystagmus

Mr. TINKER asked the Home Secretary if his attention had been draw to cases where mine workers who had been suffering from nystagmus had been declared recovered by the medical referee and fit to resume their former occupation, but had been refused employment on the grounds that they were liable to contract nystagmus again; and if he would consider amending the Workmen's Compensation Act so as to entitle them to compensation when they could prove they were deprived of employment because of having suffered from this disease.—Sir JOHN GILMOUR replied: Nystagmus is not the only injury or disease in view of which employers may be unwilling to take the risk of re-engaging the workmen for his old work when he has become physically fit for it; and the question whether in such circumstances it is desirable, and indeed in his own interests, that the workman should be entitled to further compensation is by no means a simple one. Various other proposals have been made for modifying the conditions under which compensation is payable for this disease, and a full inquiry would be necessary before the question of amending legislation could be considered.

Mr. TINKER: Is the Minister aware that the House of Lords on June 11th decided a case of this character, and that it is imperative that something should be done because the men have no right to claim compensation and cannot get work when they are suffering from this disease? Surely the time has come when we should protect men in cases like these?

Sir J. GILMOUR: If I were satisfied that there was a general demand in the mining industry for an inquiry into this subject I would be prepared to set up a committee.

MONDAY, JULY 2ND

Medical Practitioners in Palestine

Mr. WEDGWOOD asked the Secretary of State for the Colonies (1) whether and, if so, why new immigrant doctors into Palestine were restricted to five a year; and whether there was a limitation on the numbers of doctors or lawyers allowed to practise in any other British Colony or Dominion; and (2) whether there were any and, if so, what restrictions on the number of Jewish refugees from Germany practising as doctors in Palestine; and, if so, who asked for the restriction.—Sir P. CUNLIFFE-LISTER replied: In March last the Executive of the Jewish Agency in Palestine was informed of the proposal of the Palestine Government to institute measures for the limitation of the number of licences to be issued annually to doctors, dentists, and advocates. I am not aware that any request for such restrictions had been made. No legislation has yet been enacted to give effect to these proposals, which are at present the subject of correspondence between the High Commissioner and myself. So far as I am aware, no similar system of limitation exists in other British Dependencies or in the self-governing Dominions.

Quinine Stocks in India

The Duchess of ATHOLL asked the Secretary of State for India if he would explain why 300,000 lb. of quinine owned by the Government of India were lying idle; for how long this had been the case; and what arrangements were now in contemplation for making this stock of quinine available for the millions who annually suffered from malaria and could not procure it.—Sir S. HOARE replied: The Government of India habitually maintain a reserve stock of quinine for emergencies. This reserve rose to 300,000 lb. about 1926 and continued at or above that figure until 1932. Measures have since been initiated to reduce it to 150,000 lb. which is regarded as a sufficient reserve. In March, 1933, it had been reduced to 282,759 lb. I have no later figure, but I understand that the Government of India are doing their best to increase sales. I will ask them for a further report with reference to the last part of the question.

Disposal of London Refuse

Sir FRANCIS FREMANTLE asked the Minister of Health whether the Advisory Committee on London Refuse had yet reached any conclusions for the improvement of the disposal of refuse; and what action the Ministry of Health proposed taking in the matter.—Sir HILTON YOUNG replied: I understand that the draft of an interim report is now being considered by the committee. I hope that the committee can complete this report at an early date.

Bonus and Salary in Civil Service

Mr. JOHN WILMOT asked the Chancellor of the Exchequer if he could make any statement as to the intention of the Government with regard to the consolidation of bonus and salary in the Civil Service.—Mr. DUFF COOPER (Financial Secretary to the Treasury) replied: It is a matter of regret that the negotiations on this subject on the Civil Service National Whitley Council have resulted in the inability of the staff side to enter into an agreement with the official side on the basis of the proposals made by them with the approval of the Government. The Government have accordingly reviewed the whole position in the light of all the circumstances. They are satisfied that the proposals made are fair and reasonable and that it would be right to put them into operation from July 1st. An announcement to this effect was accordingly made at the meeting of the National Whitley Council on Friday, June 29th, and detailed instructions will be issued at an early date.

The following is a summary of the proposals in broad outline:—

Consolidation will be effected as from July 1st, 1934, on the terms set out in paragraphs 352, 355, and 356 of the report of the Royal Commission on the Civil Service, or with reference to a cost of living figure of 55, whichever is more favourable, with the proviso that the remuneration so arrived at shall remain subject to abatement at the appropriate rates so long as half the emergency reductions continue in force. In other words, the pay of a civil servant, hitherto remunerated by means of basic pay plus cost of living adjustment under the stabilisation agreement, will be measured (for so long as half the emergency reductions remain in force) as half-way between his pay under that agreement and the consolidated pay which would result from the full application of the consolidated scheme. In all cases of established civil servants retiring on or after July 1st, 1934, the full consolidated rate will be deemed to be the annual salary and emoluments of the office within the meaning of Section 2 of the Superannuation Act, 1859, by reference to which pensions, additional allowances, and gratuities will be calculated. In accordance with the terms of Section 4 of the Superannuation Act, 1887, awards of gratuities

under that section or Section 3 of the Superannuation Act, 1914, to unestablished civil servants or their dependants will be calculated upon the pay actually received—i.e., the consolidated rate less the abatement. Whereas hitherto only 75 per cent. of bonus has been reckoned for such awards, gratuities awarded to persons retiring on or after July 1st, 1934, will be calculated upon the full amount of pay actually received.

TUESDAY, JULY 3RD

Medical Inquiry into the Case of Walter Prince

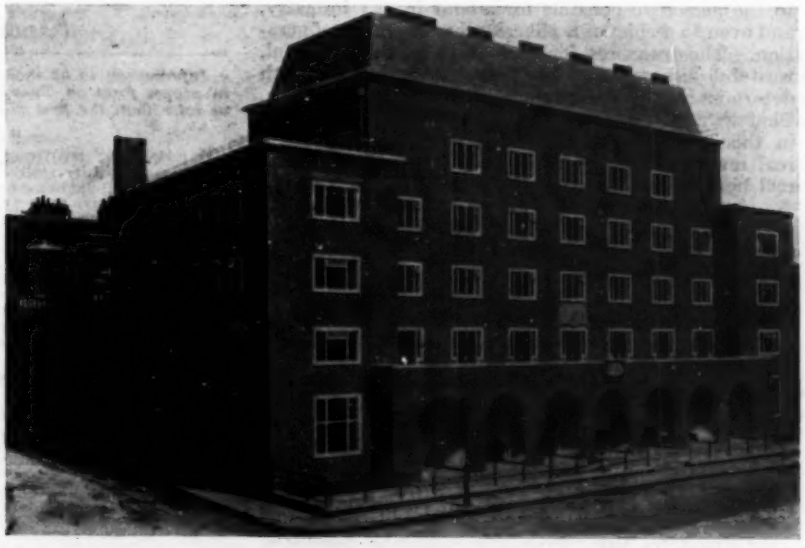
Mr. STOURTON asked the Home Secretary the result of the police inquiry concerning the confession of Walter Prince to the murder of Charles Armstrong of Manchester; whether Prince was considered to be in full possession of his faculties; and which police authority had conducted these inquiries. Mr. SUTCLIFFE asked a similar question.—Sir J. GILMOUR replied: A medical inquiry has been held into the state of mind of Walter Prince and he has been found to be insane. With regard to his statement that he had been concerned in the murder of Charles Armstrong, a comparison between allegations made by Prince and known facts showed that this statement was false, and Prince has since repudiated any connexion with that crime. The responsibility for investigating Prince's statement rests with my department, but for the purpose of enabling some of his allegations to be checked certain inquiries were made in Manchester by the Manchester police.

Dog Poisoning

Sir ROBERT GOWER asked the Home Secretary whether, having regard to the large number of cases of poisoning dogs and other animals which had occurred recently, he would consider the desirability of further restricting, by the introduction of legislation or otherwise, the sale of poisonous substances.—Sir J. GILMOUR replied: It is already an offence punishable by a fine not exceeding £10 to put any poison or poisoned food or liquid in any place to which dogs and other domestic animals have access, and I have no information that would lead me to believe that any amendment of the law in this respect is necessary.

A STUDENTS' HOSTEL

THE accompanying photograph shows the new students' hostel of the London Hospital a day or two before its completion. The excellence of the outward design may be apparent but cannot be fully appreciated without seeing the building itself. In a neighbourhood of mean streets it stands as an example of intelligent and harmonious architecture. Without extravagance of any kind it has the spaciousness associated with civilised life. It is not a collection of rooms stuck together with walls, but a great house with a personality of its own—most clearly expressed perhaps in numerous unexpected balconies and roof gardens where it would be pleasant to sit on summer evenings.



At the opening by the Queen last Tuesday the principal rooms were all furnished, and also many of the 50 single rooms which the students will live in. Each of these has a gas fire (with meter) set as a panel in the wall, a sophisticated modern wardrobe with places for everything, a divan bed, an armchair and a knee desk. At present they are uncomfortably uniform—except in shape—but contrasts in the personality and belongings of the occupants should soon put that right. More serious objection, perhaps, can be taken to the furniture (of dark limed oak), which is so much in fashion that it will soon be out of it. This hardly applies, however, to the chairs, tables, and fittings of some of the public rooms—particularly the writing room, the library, and the common room—which are so good of their kind that they should be preserved indefinitely as belonging to the period. The library has a good portrait of the late Lord Knutsford, after whom it is named.

Upstairs there are plenty of bathrooms, besides comfortable quarters for matron and for warden. The presence of shower baths and lockers in the fourth-floor washing-rooms is explained when one reaches the fifth; for here, comprising the whole space inside the slated roof, are two fine courts for squash rackets—not to mention a view of East London from the roof.

Subscribers who visit the hostel will find themselves wishing to subscribe more to it; and this would be a welcome act, since a further sum of £17,000 remains to be raised. It is essential that the rents charged should be kept low so as to be within the means of any students who ought to have access to the hostel, and the debt must therefore be somehow reduced. Meanwhile the authorities have not allowed their scheme to be damaged by lack of faith. The London will long have reason to be grateful to the architect, Mr. Edward Maufe, F.R.I.B.A., for his achievement. For besides incorporating the hospital's coat of arms in various parts of the building he has also managed to introduce something of its tradition and standard.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

MEMORIALS TO MANSON AND ROSS

A RECEPTION was held at the London School of Hygiene and Tropical Medicine on Friday evening, June 29th, to celebrate the incorporation of the Ross Institute in the school. Over 600 people were present. In the absence of Sir Austen Chamberlain, the guests were received by Sir Herbert Read, Sir Charles McLeod, and Dr. W. W. Jameson, the Dean of the school.

The ceremony of the evening was the unveiling by Lord Athlone, Chancellor of the University of London, of a tablet containing a medallion of Manson by Dr. Paul Richer, the gift of Lady Manson and family, and a bust of Sir Ronald Ross, presented by the sculptor, Lady Welby. Lord Athlone referred sympathetically to the collaboration between Manson and Ross, and quoted the letter dated March 21st, 1898, in which Ross wrote to Manson: "My one wish is that you were here to share with me the pleasure which I have experienced yesterday and to-day in seeing your induction being verified step by step." Manson Lord Athlone described as a great doctor, a humane being, and a thinker. He spoke of Ronald Ross's devotion to the cause of preventing disease, and pointed out that "the problem of antimalaria work is not a biological problem alone; it is also largely a sanitary and engineering problem. It is one which must be dealt with not only by governments and municipalities, but by everybody, from the director of public health to the person responsible for labour in any industry, and even to a chief of a village, all working in coöperation. The measures for stamping out this dreadful, wasteful disease must go forward everywhere with determination, with courage, and with high hope. That way lies the true path along which the workers in this school must go if they are to give Ross a real reward for his sacrifice and his labours, and do real honour to his memory."

After the ceremony the guests had an opportunity of seeing a large number of exhibits and demonstrations, showing the work being done by the various departments of the school.

Manson and Ross memorabilia were shown, with exhibits illustrating their discoveries demonstrated by Prof. R. T. Leiper, F.R.S., Mr. Wm. McDonald, and Sir Rickard Christophers, F.R.S.

Department of Entomology.—Prof. P. A. Buxton and Dr. V. B. Wigglesworth, in a demonstration of insects noxious to man, showed living specimens of: (1) anopheles mosquitoes, eggs, larvæ and pupæ in water, and adults; (2) tropical rat-fleas; (3) bed-bugs; (4) large tropical bugs; (5) mosquito-eating fish.

Department of Protozoology.—Dr. A. Robertson showed protozoal parasites causing disease in man, including malaria parasites, living trypanosomes, amœbæ, flagellates, spirochætes, Leishmania bodies, and trypanosomes.

Division of Clinical Tropical Medicine.—Dr. G. Carmichael Low demonstrated facilities for the teaching of tropical diseases, including maps and charts.

Department of Helminthology.—Prof. R. T. Leiper, F.R.S., Dr. B. G. Peters, and Mr. McDonald showed worms of medical importance, notably roundworms, tapeworms, and flukes.

Institute of Agricultural Parasitology.—Dr. M. J. Triffit and Dr. R. H. Hurst showed worm infestations of animals and plants of economic importance, including worm nodule in beef, cardiac filariasis in dog, worm diseases of sheep, and eelworm diseases of economic plants.

Department of Epidemiology.—Prof. Major Greenwood, F.R.S., and Mr. A. Bradford Hill, D.Sc., showed large scale diagrams illustrating the incidence of epidemic diseases in England and Wales. The very large epidemic of scarlet fever was a notable feature of the past year. Special attention is being paid to notifications of death from influenza for the purpose of detecting whether in epidemic times there is any return to the abnormal age-distribution of deaths characteristic of the pandemic in 1918–19.

Department of Industrial Psychology.—Prof. Millais Culpin and Miss May Smith exhibited diagrams showing the relation between industrial accidents and psychological tests; intelligence and performance tests; the dotting machine designed by Prof. McDougall; and diagrams illustrating various aspects of sickness absenteeism in clerical and light occupations.

Division of Biochemistry.—Prof. H. Raistrick, F.R.S., and Dr. P. W. Clutterbuck demonstrated methods of determining the biochemistry of micro-organisms and their use in commercial processes.

Laboratory of Industrial Physiology.—Dr. Phyllis Kerridge gave a demonstration of audiometers, ear stops, and the Bragg-Paul pulsator apparatus for artificial respiration.

Mr. T. C. Angus showed an apparatus for demonstrating cyclones, a lighting installation, and apparatus for the determination of the heat-retaining properties of clothing.

Other exhibits included specimens illustrative of some of the adulterations of food and their detection (Prof. M. E. Delafield); methods of health propaganda (Lieut.-Colonel G. S. Parkinson); the hygiene of buildings (Mr. H. H. Clay); milk—from the producer to consumer (Prof. G. S. Wilson, Mr. R. C. Wright, Miss C. B. Hendry, and Miss I. Maier); maleficent and beneficent fungi (Sir Aldo Castellani).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

PADDINGTON MEDICAL SOCIETY.
TUESDAY, July 10th.—9 P.M. (at the Great Western Royal Hotel, Paddington, W.), Prof. C. A. Pannett: Minor Operative Surgery, to be followed by a discussion.

SOCIETY FOR THE STUDY OF INEBRIETY.
TUESDAY, July 10th.—4 P.M. (at the Medical Society of London, Chandos-street, Cavendish-square, W.), Dr. John Y. Dent: Apomorphine in the Treatment of Anxiety States, especially Alcoholism.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, July 11th.—2.30 P.M. and 8.15 P.M. (at the Royal Society of Tropical Medicine and Hygiene, 26, Portland-place, W.), Conference on Occupational Therapy.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, Wimpole-street, London, W.
MONDAY, July 9th, to SATURDAY, July 14th.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, Afternoon Course in Dermatology.—ALL SAINTS HOSPITAL, Austral-street, West-square, S.W. Afternoon and evening Course in Urology.—WEST END HOSPITAL FOR NERVOUS DISEASES, In-patient Department, Gloucester-gate. Demonstration on Fundus Oculi by Mr. R. Lindsay Rea, at 8.30 P.M., on Tues. (Specially suitable for M.R.C.P. candidates.)—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W. Lecture-demonstration by Dr. A. E. Clark-Kennedy at 2.30 P.M. on Tues.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Lecture-demonstration by Dr. W. J. O'Donovan on Dermatological Cases, at 3 P.M. on Sat.—PANEL OF TEACHERS: Individual clinics, in various branches of medicine and surgery, are available daily.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, July 11th.—4 P.M., Mr. G. Viner: Common Diseases of the Eye.

UNIVERSITY OF BIRMINGHAM.
TUESDAY, July 10th.—3.30 to 5 P.M. (at the General Hospital), Mr. C. A. Raison: Present-day Treatment of Minor Injuries.
FRIDAY.—3.30 to 5 P.M. (at the Queen's Hospital), Mr. W. E. Barnie-Adshead: Abdominal Examination in Midwifery with Illustrative Cases.

MEDICAL NEWS

University of Oxford

On June 21st the degree of doctor of medicine was conferred upon H. E. Harding.

Dr. T. B. Heaton, Dr. R. S. Creed, and Dr. F. G. Hobson have been elected to the board of the faculty of medicine.

At recent examinations the following were successful :—

Pathology.—W. J. C. Anstie, R. J. Bence, H. S. Brodribb, S. H. L. Bullmore, M. C. Chapman, G. A. Hodgson, G. O. Jelly, Neil Leitch, G. L. M. McElligott, W. P. Mallinson, D. F. G. Moir, J. C. Penton, E. M. Poulton, J. L. Reid, O. H. J. M. Telling, E. G. Tuckwell, J. W. A. Turner, F. G. Ward, and T. M. Williams.

Forensic Medicine and Public Health.—R. J. Bence, H. S. Brodribb, Roy Clarke, J. P. Dewsberry, A. Fearnley, R. C. Garman, G. E. Greenwood, T. W. Lloyd, R. McDonald, and T. M. Williams.

Medicine, Surgery, and Midwifery.—P. C. Alexander, J. H. Bartlett, R. J. Bence, C. A. Boucher, E. M. Buzzard, A. M. G. Campbell, J. P. Dewsberry, W. E. Fawcett, R. H. Gardiner, D. W. Geidt, C. E. Greenwood, T. W. Lloyd, J. R. Nassim, A. G. Palin, J. E. G. Pearson, and W. H. A. Picton.

The Theodore Williams Scholarship in pathology for this year has been awarded to D. F. G. Moir.

An election to the Staines medical fellowship will be made by the rector and fellows of Exeter College in the course of the Michaelmas term. The fellowship is offered for research at Oxford in one of the medical sciences and is tenable for a maximum period of five years. Particulars will be found in our advertisement columns.

University of Birmingham

On June 30th the honorary degree of doctor of law was conferred on Dr. C. A. Lovatt Evans, F.R.S., professor of physiology at University College, London. The following ordinary degrees were also conferred :—

M.D.—H. P. Gilding.

M.B., Ch.B.—Phyllis M. Ball, R. M. Case, and F. H. Kemp (with second class honours); Norman Angel, T. D. Brettell, C. H. Catlin, C. H. Goodliffe, Bessie W. Goodwill, E. G. Gregory, Joan E. Hickinbotham, Christia F. Lucas, E. C. Ostler, O. C. L. Pitter, A. B. Rowlands, and C. R. St. Johnston.

National University of Ireland

At recent examinations at University College, Cork, the following candidates were successful :—

M.D.

John Magner and J. H. Stritch.

M.CH.

Myles McSwiney.

M.B., B.CH., B.A.O.

V. J. Dillon (second class honours); R. T. Ahern, R. G. Cross, V. J. Dillon, G. A. P. Hurley, Bartholomew Hutch, H. L. Lentin, M. J. McCarthy, C. P. O'Flynn, and M. J. O'Sullivan.

Part I. only.—Jeremiah Cogan, J. J. Hurley, T. P. O'Brien, T. P. O'Connor, D. G. O'Driscoll, Catherine M. Sullivan, and Thomas Sutton.

Part II.—Brendan Buckley, D. J. Burgess, M. D. Hegarty, J. F. McCarthy, and T. J. Mullins.

University of St. Andrews

On June 29th the honorary degree of LL.D. was conferred on Sir Gowland Hopkins, P.R.S., and Lord Moynihan. The following ordinary degrees and diplomas were also conferred:

M.D.—G. B. S. Chawla, W. F. Harper, (Thesis awarded honours and a Rutherford gold medal), Jean H. Morton, W. A. Troup, and K. C. Virmani.

M.B. Ch.B.—Daniel Alenick, Abraham Berens, A. G. Burke, Louis Chais, Margaret M. W. Dickie, D. M'L. Douglas, Paul Geyser, W. M. Gibson, J. J. Goliger, J. G. Hunter, F. A. Ibiam, J. D. Katz, F. L. Krulevetsky, Alexander Kushner, Simon Kwalwasser, Harry Levenbook, H. J. Lindenauer, C. A. M'Pherson, Margaret P. Miller, Agnes W. Morton, H. D. Niedelman, William Pearlman, A. J. Pitkeathly, Leonard Rochmes, Jane B. Roy, S. S. Safir, Elias Schneider, Max Schwartz, Robert Webster, Aaron Weiner, and H. S. Wolfe.

D.P.M.—J. F. Murray, A. B. Stewart, and Gilbert Walker.

University of Glasgow

On June 29th the following degrees were conferred :

M.D.—Katharine J. Guthrie (with high commendation); I. M. Orr (with commendation), D. P. K. Jockel, and W. L. Scott.

University of Edinburgh

On June 28th the honorary degree of doctor of laws was conferred on Dr. Robert Hutchison, physician to the London Hospital, and Dr. Theobald Smith, director of animal pathology at the Rockefeller Institute for Medical Research, New York.

A reception will be held by the President and Council of the Royal College of Surgeons of England at the College in Lincoln's Inn Fields on Wednesday, July 11th, from 9 P.M. to 12, when as usual a number of interesting exhibits may be expected.

University of Durham

On June 27th the honorary degree of M.D.S. was conferred on Mr. T. R. D. Walkinshaw, of Newcastle-on-Tyne.

Royal Society of Medicine

At the annual general meeting of this society on July 3rd Dr. Robert Hutchison was elected president for the coming year, and the following were elected presidents of sections : Dr. H. P. Crampton (anæsthetics); Dr. R. C. Jewesbury (disease in children); Mr. E. G. Slesinger (clinical); Mr. J. B. Buxton, F.R.C.V.S. (comparative medicine); Dr. Henry MacCormac (dermatology); Dr. J. D. Rolleston (epidemiology and State medicine); Sir StClair Thomson (history of medicine); Mr. W. M. Mollison (laryngology); Sir Farquhar Buzzard (medicine); Dr. S. A. K. Wilson (neurology); Mr. Eardley Holland (obstetrics and gynæcology); Mr. Frank Coleman (odontology); Mr. Ransom Pickard (ophthalmology); Mr. A. H. Todd (orthopædics); Mr. E. A. Peters (otology); Dr. Paul Fildes, F.R.S. (pathology); Dr. J. Barnes Burt (physical medicine); Dr. David Forsyth (psychiatry); Dr. F. Hernaman-Johnson (radiology); Mr. Philip Turner (surgery); Prof. J. H. Burn (therapeutics and pharmacology); Dr. P. H. Manson-Bahr (tropical diseases and parasitology); Major-General P. H. Henderson (United Services); and Mr. J. B. Macalpine (urology).

Welfare of the Blind

The Minister of Health has reappointed the Advisory Committee on the Welfare of the Blind for a further period of three years. The chairman is Lord Blanesburgh, and the members include Dr. C. W. Brook, Dr. S. J. C. Holden, Dr. J. Middleton Martin, and Dr. J. M. Ritchie.

London Homœopathic Hospital

A series of post-graduate lectures starts this week. They are given on Friday afternoons from July 6th, the lecturers being Dr. W. W. Rorke, Dr. C. E. Wheeler, Sir John Weir, and Dr. D. M. Borland. Particulars were given in our advertisement columns last week.

Streatfeild Scholarships

Mr. Ivor Griffiths and Mr. P. Jacobs have been appointed scholars under the Streatfeild trust to carry out an investigation into the tonsil—its anatomy, physiology, and the relations of its lymphatic vessels. The scholarship is awarded jointly by the Royal College of Physicians of London and the Royal College of Surgeons of England.

Centenary of the Manchester Medical Society

The Manchester Medical Society was constituted on Sept. 3rd, 1834, and held its first meeting on Oct. 1st; its centenary celebrations will be held early in October next. On Oct. 3rd a meeting will be held at which it is proposed to make the following honorary members: Lord Crawford and Sir Walter Moberly (chancellor and vice-chancellor of the University of Manchester), Mr. Walter Cobbett (chairman of the Board of the Manchester Royal Infirmary), Dr. J. Murray Bligh (president of the Liverpool Medical Institution), Prof. J. A. Nixon (of Bristol), and Mr. Winstanley Hull (grandson of the first president, Dr. John Hull). The president, Dr. E. B. Leech, will give an address on Picturesque Episodes of Manchester Medical History, and an exhibition of medical material and history, relating largely to medicine in Manchester, will be held in the new central library. On Nov. 7th Prof. Nixon will give an address on Provincial Medicine. Dr. E. M. Brockbank is taking the occasion to write a history of the society, which arose from the famous Manchester Literary and Philosophical Society owing to a desire of the many medical members to discuss professional matters in private. Former members of the society who wish to attend the celebrations should notify the secretary, Oxford-road, Manchester.

International Society of Experimental Phonetics

A meeting of this society will be held in London at the end of July. On the evening of July 29th there will be an informal gathering, and on or before August 5th there will be symposium on the methods of recording and studying speech. The secretary may be addressed at 73, Welbeck-street, London, W.1.

Visits to London Buildings

Tours of the historic halls of City companies have been arranged by Kind Edward's Hospital Fund, which will take place during this month. On Tuesday, July 10th, a visit will be made to the Drapers' Hall, on July 17th to the Mercers' Hall, and on July 24th to the Merchant Taylors' Hall. On August 7th and 21st, and Sept. 24th, tours will be conducted round the Tower of London, meeting at 2.30 P.M. at the entrance gates. Tickets may be had from the secretary of the fund, 10, Old Jewry, London, E.C.2.

Royal Sanitary Institute

This institute is holding a health congress at Bristol from July 9th to 14th. Mr. Stanley H. Badock, pro-chancellor of the University of Bristol, will preside over the congress, and Sir Hilton Young, Minister of Health, will give an address on some aspects of the housing question. Prof. W. W. Jameson is to preside over the preventive medicine section, which will discuss nutrition and the public health, and the speakers include Prof. J. A. Nixon, Prof. R. H. A. Plimmer, and Dr. H. E. Magee. At a joint meeting of this section with conference of medical officers of health Dr. Charles Porter will preside over a discussion on the problem of the mental defective. The opening speakers will be Prof. R. J. A. Berry and Dr. Henry Herd. Dame Janet Campbell will preside over the maternity and child welfare section.

Post-graduate Courses in Berlin

The following international medical post-graduate courses will be held in Berlin in the autumn: internal medicine with special regard to tuberculosis, Oct. 1st–15th; tuberculosis (in the municipal tuberculosis hospital, Waldhaus Charlottenburg, Sommerfeld), Oct. 15th–20th; obstetrics and gynæcology, Oct. 15th–20th; diseases of the ear, nose, and throat, Oct. 1st–13th; pædiatrics, Oct. 22nd–27th; and surgical treatment of intrathoracic diseases with special regard to pulmonary tuberculosis from Oct. 29th–Nov. 2nd. These courses have been arranged by the Berlin Academy for Medical Post-graduate Training which has recently been founded and which now comprises all medical post-graduate education under the control of the burgermeister of the city. The address of the academy is Kaiserin Friederich-Haus, Robert Koch-Platz 7, Berlin, N.W. 7.

National Council for Mental Hygiene

A conference on occupational therapy will be held by the council at the house of the Royal Society of Tropical Medicine and Hygiene, Manson House, 26, Portland-place, London, W., on Wednesday, July 11th. Sir Henry Gauvain, medical superintendent of the Morland Clinics and Lord Mayor Treloar Cripples' Hospitals, Alton, will preside at the afternoon session which begins at 2.30 P.M. Dr. J. B. McDougall, medical director of the British Legion Village, Preston Hall, will read a paper on occupational therapy and its end-results, while Dr. Veronica Dawkins, resident medical officer at Malting's Farm Sanatorium, Nayland, is to speak on occupational therapy, its possibilities and limitations in a sanatorium. A discussion on occupational therapy in relation to orthopædic surgery will be opened by Mr. H. J. Seddon, medical superintendent of the Royal National Orthopædic Hospital. The evening session will take place at 8.15 P.M. under the chairmanship of Dr. Nathan Raw, the Lord Chancellor's visitor in lunacy. Mrs. Eleanor C. Slagle, secretary and founder of the American Occupational Therapy Association, will describe recent methods and advances in America. Dr. J. R. Rees, Dr. Elizabeth Casson, Dr. N. A. Haworth, and Miss Ruth Darwin will speak in the discussion which is to follow. The secretary of the council may be addressed at 78, Chandos-house, Palmer-street, London, S.W.1.

Prof. Grey Turner has been elected a foreign honorary member of the Accademia Lancisiana di Roma.

Memorial to a Physician

The Lord Mayor of Birmingham, Alderman H. E. Goodby, recently opened a new laboratory and X ray department at the Midland Hospital, Birmingham, erected as a memorial to the late Dr. John Wingfield, for more than 40 years honorary consulting physician to the hospital.

Wakefield Municipal Hospital

On June 29th Sir Hilton Young, the Minister of Health, opened the new hospital which has been built at Wakefield to take the place of the old isolation hospital. It has 97 beds and is intended to provide accommodation for all cases of notifiable disease which require hospital treatment. The hospital comprises two fever blocks, diphtheria and tuberculosis pavilions, and a block of cubicles which are grouped round the central administration block. A discharge block and a technical block stand a little apart. Mr. J. B. Sykes, of Wakefield, has made it possible to build the hospital by a gift of over £60,000.

St. Bartholomew's Hospital, Rochester

In 1933 this hospital treated 1826 in-patients at an average total cost per head of £9 11*s.* 6*d.*, and 10,863 out-patients, who cost 5*s.* 11¾*d.* each. There was a small excess of expenditure over income. The extensions fund now exceeds £55,000, most of which has already been spent. It is hoped during the present year to build an additional theatre unit, and to reconstruct and modernise the existing theatre. For the second successive year the association of friends of the hospital has contributed £5000 to the general maintenance fund.

Guy's Hospital

The annual report opens upon a jubilant note. "The year has been one of steady progress and improving financial outlook. A record number of patients—12,288—have passed through the wards, and the income to supply their needs has reached a record figure. For the second successive year it has been possible to avoid those borrowings or inroads into capital which have been so unfortunate a feature of the hospital's finance since the war." In-patients admitted numbered 11,785, an increase of more than 500, the highest total recorded. The average daily number of occupied beds rose slightly to 564, but the chief factor increasing the admission of patients was a reduction of three days—from 30 to 27—in the average length of stay of patients in the medical wards. As a consequence it was possible to increase the admission of medical cases by about 12 per cent. A reduction of one day in the average residence of surgical patients, were such possible, would admit at least 600 more cases in a year, but surgical patients remain, on the average, only 13 days in the hospital. The average weekly cost of each in-patient was £4 10*s.* 11*d.* Discussing the results of the new system of charges to out-patients, the report remarks that every class of these patients, with the exception of nervous diseases, has shown a fall in numbers.

The Scarcity of Water

Speaking at Bridgwater the Minister of Health said that recent rains had not made it any less necessary to save water. Local authorities should plan ahead for August and September. The Ministry had been and was helping the rural districts in dealing with the emergency, but the rural authorities must also press forward with their applications for help for permanent water schemes out of the million pounds now available. A hundred authorities had already made applications, covering 457 parishes, and involving work to the value of one and a third million pounds, and it was evident that the grant was likely to cover total work of a value a good deal greater than that originally supposed. The path of progress in improvement was the rationalisation of areas of supply so as to bring them into closer relation with the facts of nature. It would also be necessary to consider how far it was the duty of water authorities to supply water to every house in the country, however isolated. That had never been the basis of their duties in the past, and if they were to accept such an obligation it must mean a very big increase of expense for the ratepayer or taxpayer.

Appointments

CREAK, MILDRED, M.D., M.R.C.P., D.P.M. Lond., has been appointed Medical Director of the North-Western Child Guidance Clinic.

DAVIES, H. W., M.R.C.S. Eng., D.M.R.E., Honorary Radiologist to King's College Hospital.

HENDRY, R.W., M.B. Aberd., F.R.C.S. Edin., Assistant Honorary Surgeon, Royal Infirmary, Halifax.

MACLEOD, A. CAMERON, M.B. B.S. Lond., F.R.C.S. Eng., Honorary Surgeon to the Connaught Hospital, Walthamstow.

PYRAH, L. N., Ch.M. Leeds, F.R.C.S. Eng., Honorary Surgeon to the Leeds Public Dispensary and Hospital.

RAWLINSON, R. L., B.Chir. Camb., Director of the Radiological Department at the Brompton Hospital for Consumption.

TAIT, C. B. V., M.B., B.S. Lond., D.O.M.S., Hon. Consulting Ophthalmic Surgeon, The Savernake Hospital.

WILSON, D. S. POOLE, M.S. Dubl., F.R.C.S. Eng., Honorary Assistant Surgeon to the Manchester Children's Hospital, Pendlebury.

Bristol Royal Infirmary.—The following appointments are announced:—

TODD, A. T., M.B. Edin., M.R.C.P. Lond., Honorary Physician.

MOORE, L. A., M.B. Brist., Honorary Anæsthetist.

SUTTON, G. E. F., M.C., M.D., M.R.C.P. Lond., Honorary Assistant Physician.

PRIDIE, K. H., M.B. Lond., F.R.C.S. Eng., Honorary Registrar to the Orthopædic Department.

Royal Masonic Hospital—The following appointments are announced:—

GILL, A. MORTON, M.B. Lond., House Physician.

PACEY, H. K., M.D. Victoria, House Surgeon.

BULLOCK, W., M.B. Liverp., House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: MARTIN, T. G. H., M.B. Ch.B. Glasg. (Lesmahagow, Lanarkshire); HEWITSON, W. A. (Haswell, Durham).

Vacancies

For further information refer to the advertisement columns.

Adelaide, South Australia, University and Hospital.—Bacteriologist.

Bath, Royal United Hospital.—H.S. Also Out-patient and Cas. O. Each at rate of £150.

Birkenhead C.B.—Res. Asst. M.O. £350.

Birmingham General Hospital.—Visiting Gynæcological Reg. £50.

Birmingham, Queen's Hospital.—Res. Med. Reg. £200.

Birmingham and Midland Eye Hospital.—Third H.S. At rate of £100.

Bristol, Children's Orthopædic Hospital and Sanatorium, Frenchay Park.—R.M.O. £250.

Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £80. Also Cas. H.S. At rate of £100. Also Hon. Obstetrician, Hon. Asst. Anæsthetist. Also Med. Reg.

Cambridge, Addenbrooke's Hospital.—H.S.A. Also Res. Anæsthetist and Emergency Officer. Each at rate of £130.

Cardiff Isolation and Small-pox Hospitals.—Res. Med. Supt. £720.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Chester, Barrowmore Hall, Great Barrow.—H.P. At rate of £100.

Chester, Royal Infirmary.—Two H.S.'s. Each £150.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.

Connaught Hospital, Walthamstow, E.—H.P. and H.S. Each at rate of £100.

Devizes, Wilts County Mental Hospital.—Med. Supt. £900.

East Grinstead Urban and Uckfield Rural Districts.—M.O.H. £800.

East Ham and Southend-on-Sea Mental Hospital.—Med. Supt. £900.

Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Ear, Nose and Throat Dept. Each at rate of £150.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.P. and H.S. Each at rate of £150.

Grimsby and District Hospital.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Hampshire County Council.—Asst. County M.O. £600.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.P. At rate of £100. Also Cas. Surg. O. for Out-patient Dept. At rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—Three Out-patient Surgical Registrarships. Each £200.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—Cas. O. Also third H.S. Each at rate of £150.

King Edward Memorial Hospital, Ealing.—Jun. Res. M.O. At rate of £150.

Leamington Spa, Warneford General Hospital.—Res. H.S. to Cas. and Special Depts. At rate of £150.

Liverpool, Stanley Hospital.—H.P., H.S.'s, &c. Each at rate of £100.

Llanelly and District Hospital.—H.S. £150.

London Hospital, E.—Hon. Asst. Anæsthetist.

London School of Hygiene and Tropical Medicine, Keppel-street, W.C.—Wandsworth Scholarship. £370.

Maidstone, West Kent General Hospital.—H.P. and H.S. Each £150.

Manchester, Ancoats Hospital.—H.S. to Special Depts. At rate of £100. Also Surg. Reg.

Manchester, Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Asst. M.O. to Dermatological Dept. £35.

Manchester, St. Mary's Hospitals.—Three H.S.'s to Special Depts. Each at rate of £50. Also Asst. M.O. At rate of £150.

Mansfield, Harlow Wood Orthopædic Hospital.—Two H.S.'s. Each at rate of £175.

Melton, Suffolk, St. Audry's Hospital for Mental Diseases.—Locum Tenens Asst. M.O. 7 gns. per week.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. and H.S. At rate of £100. Also Res. Surg. O. £250.

Norwich City.—Asst. M.O.H., &c. £500.

Norwich, Norfolk and Norwich Hospital.—H.S. to Spec. Depts. £120.

Nottingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Oxford, Exeter College.—Staines Medical Research Scholarship. £400.

Preston, Biddulph Grange Orthopædic Hospital.—Sen. and Jun. H.S.'s. At rate of £250 and £150 respectively.

Preston, County Mental Hospital, Whittingham.—Jun. Asst. M.O. £500.

Prince of Wales's General Hospital, W.—Hon. Physician to Children's Dept.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—Dermatologist.

Queen Mary's Hospital, Sidcup, Kent.—Asst. M.O. £250.

Reading, Royal Berkshire Hospital.—Res. Anæsthetist. £150.

Royal College of Surgeons of England.—Election to Court of Examiners. Also Examiners in Dental Surgery.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—H.S. for Brockley Hill, Stanmore. At rate of £150.

St. Giles' Hospital, Brunswick-square, Camberwell, S.E.—Clin. Asst. At rate of £100.

St. John's Hospital, Lewisham, S.E.—H.P. and Cas. O. Each at rate of £100. Also Hon. Surgeon.

Salford Royal Hospital.—H.P. At rate of £125.

Sheffield Children's Hospital.—H.S. Also H.P. Each at rate of £100.

Shoreham-by-Sea, Southlands Hospital.—Temp. Asst. M.O. £350.

Shrewsbury, Royal Salop Infirmary.—Cas. O. and Res. Anæsthetist. At rate of £160.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £150.

Southend-on-Sea General Hospital.—Res. Obstet. and Gynæcological O. At rate of £125.

Southern Rhodesia Medical Service.—Government M.O. £600.

Taunton and Somerset Hospital.—H.P. At rate of £100.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

Western Dispensary, Rochester-row, Westminster, S.W.—Vacancy on Attending Medical Staff.

Westmoreland Sanatorium, near Grange-over-Sands.—H.P. At rate of £250.

Willesden General Hospital, Harlesden-road, N.W.—Hon. Phys. to Skin Dept.

Witham, Essex, Royal Eastern Counties Institution.—Med. Supt. £600.

Wolverhampton, Royal Hospital.—H.P. and H.S. At rate of £125 and £100 respectively. Also H.S. for Orthopædic and Fractures Dept. At rate of £100.

Births, Marriages, and Deaths

BIRTHS

BELTON.—On June 19th, at Wilbraham-place, Sloane-street, S.W., to Dr. Mary and Dr. W. Belton—a daughter.

DEATHS

BERNSTEIN.—On June 30th, at Gloucester, Sidney Bernstein, B.S., M.R.C.S., formerly of Johannesburg.

BROOK.—On June 27th, at Fareham, Hants, Henry Darville Brook, V.D., D.L., late Colonel R.A.M.C. (T.), aged 71.

CRIDLAND.—On St. Peter's Day, 1934, at Salisbury House, Wolverhampton, Arthur Bernard Cridland, F.R.C.S. Edin., D.O. Oxon., M.R.C.S. Eng., L.R.C.P. Lond., dearly loved husband of Evelyn Fisher Cridland, aged 61.

DYBAL.—On June 29th, at Boulders, Haytor, Devon, Brennan Dybal, F.R.C.S., of Southernhay West, Exeter, aged 62.

FORWARD.—On July 2nd, at his residence at West Park, Mottingham, S.E., Francis Edward Forward, O.B.E., F.R.C.S., late Medical Officer of Antigua, B.W.I., and of His Majesty's Home Office Department.

GORHAM.—On June 23rd, at St. Bride's, Galway, James John Gorham, M.D., J.P., of Clifden, Connemara, and Ashley-gardens, Westminster, in his 84th year.

MAWER.—On July 1st, Percy Uvedale Mawer, M.R.C.S., L.R.C.P., of Wimpole-street.

NORTON.—On June 30th, at the Old Rectory, Chilfrome, Dorset, John Norton, M.D., M.R.C.S., in his 70th year.

SCORER.—On July 1st, at St. Cuthbert's, Christchurch-road, Bournemouth, after a long illness patiently borne, Frank Scorer, M.B.E., M.R.C.S., L.R.C.P.

STATHAM.—On June 30th, Reginald Whiteside Statham, J.P., M.R.C.S., Past Master of the Society of Apothecaries, of Cheddar, Somerset.

N.B.*—*A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

SNAKE-BITE IN THE BRITISH ISLES

By BURGESS BARNETT, M.R.C.S. Eng.
CURATOR OF REPTILES, ZOOLOGICAL SOCIETY OF LONDON

THERE are three species of snakes in this country—the northern viper or adder, *Vipera berus*; the grass or ring snake, *Natrix natrix*; and the smooth snake, *Coronella austriaca*. Only the first of these is venomous. Many non-poisonous tropical snakes bite viciously when disturbed, but of the two harmless British species natrix never bites under any provocation and coronella very seldom does so. Since the latter is a rare snake, found only in the counties of Dorset, Hampshire, and Surrey, it may generally be assumed that any bite from an indigenous snake is that of an adder.

The differential characters which distinguish the adder from the other British snakes are as follows:

Length.—It is seldom more than 18 inches long, though a 3-foot specimen has been once recorded. Any snake over 2 feet in length may be assumed with fair safety to be a grass snake. The length of snakes is, however, apt to be exaggerated.

Habitat.—It frequents dry situations, such as would be chosen by campers, whereas grass snakes prefer damp places.

Coloration and skin pattern.—The ground-colour of male adders is buff or occasionally reddish; that of the females brown without any tinge of green. The pattern is the same in both sexes; on the head there is a black V with the apex towards the snout and a broad zigzag band extends from the neck to the tail. These marks are always present except in rare cases of melanism, but they are obscure in dark females. There is never a yellow band bordered behind by black on the neck, nor lateral series of black spots on the flanks (as in natrix). Closely examined, the scales are not perfectly smooth (as in coronella) but keeled. The ventral surface is commonly bluish.

Adders are sluggish snakes and seldom bite even when handled; thus of 26 adders which were deliberately teased to collect their venom only 3 could be induced to bite voluntarily. The risk of a snake-bite would not seem, therefore, to be very great; yet several cases are reported every year and a recent one, that of an infant, ended fatally.

The mechanism of the adder's bite is a very perfect one. The two fangs are situated in the front of the mouth, attached to short maxillæ which rotate so that the fangs become erect in the act of striking. They are hollow and in communication with ducts from venom-secreting glands homologous with the parotids, the contents of which are squeezed out mechanically by muscular action. The venom is a clear amber-coloured fluid which dries into transparent needles or scales, and in this state it retains its toxicity indefinitely.

The quantity of venom which can be injected by a British adder is difficult to measure exactly, but it is equivalent to between 5 and 10 mg. of the dried substance. The minimum lethal dose for an adult is probably in the region of 50 mg. It is similar to other viperine venoms which have been shown to contain an alarming array of toxins, and it certainly contains: (*a*) a depressor of the vasomotor system; (*b*) a depressor of cardiac muscle; (*c*) an antithrombin ferment, or perhaps a hæmorrhagin; and (*d*) a thrombin ferment. Clinically, however, the vasomotor depressor, reinforced perhaps by the depressor of cardiac muscle are the only toxins noticeable in ordinary cases.

SYMPTOMS AND TREATMENT

Typically symptoms begin about an hour after the patient has been bitten, with pallor, sweating, and a rapid, feeble pulse. Vomiting and diarrhœa, sometimes blood-stained, are regular features. There is no local pain. In adults acute symptoms subside in a few hours and are followed by lymphangitis persisting for from four to seven days.

There is some evidence that the onset of symptoms may be delayed by exercise, for it is almost the rule for a patient hurrying to a doctor to collapse on arrival. Whether this delay is real or only apparent, exercise can hardly fail to accelerate absorption of the venom and should be forbidden. Brandy and other cardiac stimulants are contra-indicated for the same reason.

For healthy adults, where no very grave results are to be anticipated, treatment may well be expectant, but in the case of small children and invalids energetic measures are called for. These measures may well follow, as closely as circumstances permit, the lines laid down at the Reptile House of the London Zoo for the treatment of the bites of more deadly snakes. Keepers handling poisonous snakes are drilled in the first stages of the following routine, and sera and syringes are to hand for the later treatment.

A tourniquet is applied just above the fang punctures. Absorption of venom is so rapid that it should be a matter of seconds before this is done. Keepers are taught that a bootlace is often the first tourniquet to hand. The punctures are sucked until a knife can be procured. The venom is harmless when it is taken by mouth and (in the case of British adders) the amount likely to be absorbed by an abraded buccal mucous membrane is negligible. A criss-cross incision is made over the punctures and sucking is continued to encourage bleeding. Incisions to a depth of 4 mm. are sufficient to penetrate to the depth reached by the fangs of British adders.

Crystals of permanganate of potash are rubbed into the cut. In-vitro venom is only completely oxidised by about an equal weight of permanganate and in practice probably very little of the venom is destroyed. That little, however, might well convert a lethal into a sublethal dose in the case of an infant. The permanganate is replaced by fresh crystals as it is washed out of the incisions by bleeding.

At the earliest possible moment 10 c.cm. or 20 c.cm. of the appropriate antivenin serum is injected intravenously. If a vein cannot be reached quickly it is given intramuscularly. The dosage should not be decreased for young subjects. The effect of the serum is very marked when it is given promptly, but after a lapse of six or twelve hours it probably has little effect. Arrangements at the Zoo make it possible to inject the serum within five minutes of the accident, but elsewhere several hours would probably elapse before it could be obtained.

A reliable serum, specific against all European viperine venoms—including that of British adders—is prepared by the Pasteur Institute, and this is usually stocked during the summer months by Allen and Hanburys Ltd. As regards subsequent non-specific treatment, pituitary extract or adrenaline appear to be indicated.

INSTITUTIONAL MANAGEMENT

A LITTLE book[1] which sets out how the household accounts of hostels and other residential institutions can be kept so as to ensure a well-balanced budget will be found very useful to those concerned with institutional management. It includes an analysis of the accounts of 56 existing institutions upon the lines of the model budget suggested. The subject matter is so well arranged that it makes the complicated business of running the household side of an institution seem as if it were a job easy to perform. The principles on which a practical budget should be constructed are set out clearly and should be noted by house committees and hospital secretaries.

[1] Institutional Management and Accounts. By H. Reynard, M.A., Warden, King's College of Household and Social Science, London: Longmans, Green and Co., Ltd. 1934. Pp. 31. 5s.

NATIONAL CONFERENCE ON MATERNITY AND CHILD WELFARE

THE conference was held this year at Birmingham on July 3rd to 5th. Among the subjects discussed, at a session organised by the National Association for the Prevention of Infant Mortality, was the

Reduction of Neo-natal Mortality

Prof. LEONARD G. PARSONS said that in 25 years, 1906 to 1931, although the general infant mortality fell by one-half, the mortality rate for the first day and that for the first week fell by a bare tenth; further, the mortality rate for the whole neo-natal period (the first four weeks) was reduced by only a little more than one-fifth, and in the year 1930 actually accounted for more than one-half of the total deaths under one year.

Dr. Cruickshank's report on The Causes of Neo-natal Death, to the Medical Research Council, contained the results of an investigation of the causes of 800 neo-natal deaths, and had been considered to exhaust the subject. But he was dealing with infants dying in a maternity hospital and not with those dying in a children's hospital. Dr. Parsons had, therefore, investigated over a five-year period (1929 to 1933), at the Children's Hospital, Birmingham, 163 children who died during the first month of life and were subjected to autopsy. Cruickshank had grouped causes of death into three main divisions as follows:—

Group I.—Those (67·5 per cent. of the total) in which death was due to birth asphyxia, atelectasis, birth injury or prematurity.

Group II.—Those (29·75 per cent. of the total) in which death was due to infective conditions.

Group III.—Those in which death was the result of gross developmental defect, forming only a small proportion, 2·5 per cent. of the total number.

Dr. Parsons had divided his cases in a similar manner, and the groups showed very different proportions. Group II. formed 48·25 per cent. of the total; Group III. 33·75 per cent.; and Group I. only 18 per cent. of the total. The fact thus emerged that in a children's hospital the infections constituted the most frequent cause of death. One reason for this difference was of course obvious—namely, that the majority of the children in Group I. were likely to die in the first few days of life, and only a relatively small proportion of the children in this group was likely to be transferred to a children's hospital. Another reason was that the type of infection which was responsible for over half the deaths in Dr. Parson's series in Group II.—broncho-pneumonia and marasmus unaccompanied by septicæmia—was more likely to occur in the later than in the earlier weeks of the neo-natal period.

In lists of the causes of neo-natal deaths the term "sepsis neonatorum" was frequently used. By this term was meant a septicæmia—i.e., a generalised infection by pyogenic organisms; 15 per cent. of all Cruickshank's cases showed this condition, whereas the proportion in Dr. Parson's series was only 11 per cent. The mode of entry of organisms might be by infection of the cord; some authorities considered this route an uncommon one, although it was formerly regarded as the commonest route. Another important route was through the skin. The skin of a new-born babe was an extremely delicate organ and required the greatest care in handling, especially if the babe was premature. A third important portal was the respiratory tract. Cruickshank believed that "infection by inhalation plays a rôle of the first importance in the production of pneumonia neonatorum, and that a large number of infants so infected die with symptoms of generalised septicæmia." He apparently regarded the infection as due to the inhalation of infected material during delivery, or during the period of resuscitation after birth. In his view, with which Dr. Parsons was in complete agreement, the skin and the respiratory tract were by far the most important paths of entry of the infecting organism.

Infection of the respiratory tract was prone to occur throughout infancy. Such infection was the cause of broncho-pneumonia, wasting, and sometimes enteritis. In the last 25 years the cause of infantile diarrhœa had been found less and less in the food or in diseases of the alimentary canal, and more and more in infections elsewhere and in particular of the respiratory tract. The source of infection was to be sought in those who have charge of the child—acute or chronic nasal catarrh or cough being the most common. As a result of this contact the child's respiratory passages become infected and eventually a broncho-pneumonia was produced, or the child stopped gaining and began to lose weight without any obvious sign of disease.

Nowadays syphilis formed but a rare cause of neo-natal death. Dr. Parsons said that his review of the causes of neo-natal death had demonstrated conclusively that (1) all previous efforts to reduce neo-natal mortality had been attended with little success; (2) the chief causes of death in the first half of the neo-natal period were to be sought either in antenatal causes—e.g., birth injury, asphyxia, and atelectasis; (3) the greater proportion of deaths in the second half of the neo-natal period were the result of postnatal infection, particularly of the respiratory system, and to a lesser degree of the skin.

Dr. G. F. MCCLEARY said that neo-natal deaths now formed nearly one-half of the total infant mortality.

Early this year the National Association for the Prevention of Infant Mortality addressed a questionnaire to the medical officer of health of all local authorities administering schemes of maternity and child welfare. At the request of the Association, Dr. McCleary had examined the replies to the questionnaire and stated the results.

Replies were received from 189 local authorities, comprising the councils of 25 counties, 53 county boroughs, 43 municipal boroughs, 50 urban districts, 17 metropolitan boroughs and the City of London Corporation. Some of the replies describe in considerable detail the nature of the work undertaken, but more often the information is expressed in general terms and cannot well be summarised in statistical form. Taken as a whole, however, the replies indicate the variety of the measures adopted and the wide extent of the area in which, in varying degree, they have been brought into operation.

In some districts a slight reduction in mortality may be noted in the statistics given for the last five years, but in most there was no indication of lowered mortality during that period.

Among the measures taken to reduce neo-natal mortality, special importance is attached in the replies to the extension and improvement of antenatal care; there has been a substantial increase during the last five years in the number of clinics and in the number of attendances made. Still more important, perhaps, was the evidence afforded in a number of the replies of improvement in the care given in the clinics—for instance, of more pains taken to detect abnormal presentations, pelvic contractions, syphilis and signs of mild toxæmia. In some replies it was stated that consulting clinics have been established to which the medical officers of antenatal clinics may refer difficult cases; and cases of abortion, premature birth, stillbirth or neo-natal death were followed up, so that special attention might be given to the mothers in subsequent pregnancies. In 18 per cent. of the replies, it was definitely stated that beds for expectant mothers are provided in maternity homes or hospitals, and from some others it might fairly be inferred that such provision was made. There appeared, however, to be need for many more pre-maternity beds. Food for expectant mothers was very generally provided, and also dental treatment. In six districts the local authorities had arranged for antenatal supervision to be undertaken by general practitioners. In three, it was stated, instruction in birth control, in cases in which childbirth would be dangerous, was among the agencies in operation for the reduction of neo-natal mortality.

From a number of replies it appeared that increasing efforts were being made to improve the standard of attendance at confinements; refresher courses for midwives were arranged, the services of obstetric consultants were provided for the assistance of practitioners in difficult cases, and there had been a considerable increase in the number of hospital beds made available.

A number of replies mentioned special provision for the rearing of premature infants.

As to suggestions for further steps, Dr. McCleary said that many replies laid stress upon the need for research into the causes of the mortality.

Premature birth, for instance, as a certified cause of death, covers, it is thought, a variety of conditions the ætiology of which is obscure, and the toxæmias of pregnancy are still imperfectly understood. Apart from research, importance is chiefly attached to increased efficiency in the antenatal clinics, and to extended hospital accommodation for expectant mothers and cases of difficult labour, convalescent homes for mothers and babies, and special provision, particularly hospital beds and skilled home nursing, for premature or debilitated infants. Need for closer coöperation between the antenatal clinics and the local doctors and midwives is expressed by some districts, and a more stringent control of the sale of abortifacient drugs is advocated. In one series of neo-natal deaths investigation showed evidence in a large proportion that the mother had taken drugs to secure an early termination of pregnancy. Instruction in methods of birth control, the notification of pregnancy, and the provision of free midwifery services are recommended in a few replies.

In conclusion, Dr. McCleary said, the replies to the questionnaire encouraged the hope that a substantial reduction in neo-natal mortality might be secured at no distant date.

"SUNIC" MEDICAL CARBONS

WE have received from Messrs. Watson and Sons, Parker-street, Kingsway, London, a classified price-list of their British-made carbons from which can be seen two things: first, that in many directions the prices of the British wares are more moderate than those of many continental competitors; and secondly, that the British range of production is wide enough to meet every hospital need. In the House of Commons a few weeks ago, at a debate on the customs duty on arc lamp carbons arising out of an amendment to the Finance Bill, the committee considered the reduction of the duty. The opinion was expressed by one Member of the House that the question of price was not so important as that of satisfactory manufacture, when Dr. Burgin, Parliamentary Secretary to the Board of Trade, said that assurances had been given to the Government that British manufacturers are in a position to supply the whole requirements of the country. The amendment to reduce the duty was negatived by a substantial majority.

"LEISURE LAND"

WE learn from a former resident in the town that it has been suggested to the urban authorities at Torquay that part of the residential quarter should be reserved against the effects of fast and noisy traffic. Those seeking health or recuperating, he says, would have the benefit of the leisurely atmosphere which in days gone by was much appreciated by the older residents, "so much so that among some of them Torquay was known as 'Leisure Land.'" There are no industries in Torquay save the industry of the promotion of health, so that to some extent the uproar and bustle necessarily associated with trade are absent, yet, it is stated, the huge number of casualties due to fast motor traffic makes part of the town both dangerous and noisy. The arguments as set out might well have force with the civic authorities.

TRAINING IN DIETETICS

WE understand that a preliminary course of study in science and cookery in preparation for the Diploma Course in Dietetics has now been instituted by King's College of Household and Social Science, University of London, and will be held for the first time during the session 1934–35. This course, which will cover one academic session, has been designed mainly to meet the needs of State-registered nurses and qualified domestic science teachers who require additional scientific knowledge in order to gain the full benefit of advanced dietetic teaching. We commented on the inauguration of the diploma course last year (THE LANCET, 1933, ii., 365), and expressed the hope that the standards of previous education required in candidates would be maintained at a high level. The arrangement now made for a preliminary course will ensure this, while opening the doors of the profession of dietetics to many who would otherwise be unable to obtain the requisite training.

THE MEDICAL DIRECTORY

Messrs. J. and A. CHURCHILL (40, Gloucester-place, London, W.1) write to point out that the accuracy of the Medical Directory depends on the return of the schedules posted to each member of the profession. Should the schedule have been lost or mislaid, they will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification.

ERRATUM.—In our report of a debate on peptic ulcer, held at a meeting of the Fellowship of Medicine on May 30th, the contribution attributed to Mr. W. E. Tanner was made by another speaker. We regret the error.

FOUNDLING SITE

BY a happy coöperation between the public, the London County Council, the Governors of the Foundling Hospital, and Sir Harry Mallaby-Deeley, the last stage of the effort to acquire the whole nine acres as a welfare centre for the children of Central London has now been accomplished. The governors of the Foundling Hospital have decided to purchase the extreme northern section of the site for £100,000, and to continue there the welfare work for infants under 5 which the Appeal Council have hitherto conducted. The area to be bought by the governors is about 100,000 sq. ft., including the children's nursery and the swimming bath. It is intended to utilise the site as an infant welfare centre, a day nursery and nursery school, and for other work for little children in coöperation with the voluntary societies now working there. It is expected that the London County Council will adopt a recommendation to grant £50,000 to ensure the completion of the purchase of the whole site.

DONATIONS AND BEQUESTS.—The Croydon General Hospital has received from Sir Herbert Brown a cheque for £10,000. This, together with previous donations, makes a total gift of £15,000 towards the Extension Fund.—In addition to other bequests the late Mrs. Catherine Gertrude Elmes, of Kew, left £2000 to the Royal Infirmary, Edinburgh, to endow beds or cots in the names of her late husband and herself.—By the will of the late Mrs. Florence Martha Buck, of Muswell Hill, the National Temperance Hospital and the Queen's Hospital for Children, Hackney-road, will each receive £1000.—The late Dr. Leedham Henry Fuller, of Purley, who left estate of the gross value of £27,947, after various bequests, bequeathed the residue of the property as to one-fourth equally between: King's College Hospital Medical School, the Arethusa Training Ship, Dr. Barnardo's Homes, and the Charity Organisation Society.—The late Miss Mary Simon, of Wollerton, Salop, among other bequests, left £1000 to the Salop Infirmary for a "Dr. John Lyon" cot; £1000 to the Medical Missionary Society for "Dr. John Lyon" and "Mrs. Annie Lyon" scholarships; £300 to Market Drayton Cottage Hospital; and £1000 to the Royal Aberdeen Hospital for Sick Children, for the endowment of a cot in memory of Dr. William Lyon and his two sons.—The late Sir Albert Frederick Stephenson, of Southport, left £1000 to the North of England Children's Sanatorium for the endowment of a bed.